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An Analysis and Classification of Wage Systems

By J. J. BERLINER
Accountant and Auditor

THE problem of wage payment occupies a position of central interest in the industrial world. "How much do you pay?" "What is a fair day's wage?" These two questions are immediately put by workers on the one side and employers on the other. The question of wages presents one of the most difficult problems to be solved by industry today.

The methods which have been devised for remunerating labor may be classified into three groups as follows:

1—Time work, in which the employee is paid by the hour, the week, the month, or the year.

2—Contract work which includes different payment plans such as (a) the ordinary piece-rate method (b) the differential piece-rate method, (c) the collective contract, whereby a contractor agrees to furnish the labor for a certain quantity of product at a certain price, the contractor selecting his own method of paying those who work for him.

3—Bonus, efficiency, or premium systems, including (a) promotion systems under day rate as a reward for increased efficiency, (b) the Halsey premium system, (c) the Roman premium system, (d) the bonus system, (e) the efficiency system, (f) combinations of the above.

Time Work—With time work in its usual form, there is no record of the individual's performances. There is no incentive for effort except of such a sort as will result in the employee's recognition as a good worker by his superior and as such increase his chances for promotion. On the other hand there is really no penalty for ordinary inefficiency or time-killing. As soon as a reward is introduced for individual efficiency, a departure is made from the traditional time work or day rate, even though the reward may be of a sort which is not recognized among the so-called bonus or premium systems of pay.

As regards time work, one of the surest ways of cutting down on the waste of materials and labor is by the introduction of time and motion studies. By time and motion studies, plus standardized routing, scheduling, moving of materials, and functional foremanship, many economies will ensue. But it must be noted that unless the proper inducements are offered to employees for the extra effort necessary to follow the various instructions, together with penalties attached for failure to put forth such efforts, only a fractional part of the advantages of standardization and planning will be realized. Proper supervision as well as standardization and planning, and good working conditions, such as are developed by proper welfare activities, will go a great way toward remedying time losses under a day-rate system. In fact, these conditions are necessary in the introduction of any kind of wage system.

Ordinary Piece Rate—Piece rate system is the plan of paying for measurable results rather than for time service. At first thought, ordinary piece rate would seem mathematically fair. The system however has been so badly abused, that there exists at present, a tremendous prejudice against it.

Piece rate has been used as a bait to speed up employees to a certain pace and then, when the pace was reached at which certain workers would earn more than the management considered they were worth, the rate was cut. After several such cuts, the system produced nothing but fear and hostility together with intentional loafing on all new work, so as to get the piece rate set as high as possible,

since it was bound to be cut. If piece rate is to be used at all, it must be accompanied by a guarantee that there will be no change in rate so long as methods, tools, and machines are not changed.

However, where time reduction results through improved machinery and is no way the result of

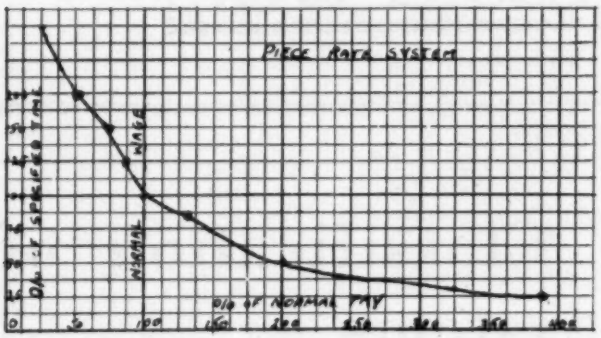


Chart I—Piece rate. Definite rate per piece. Normal pay increases with increased output and increases with lessened output.

effort on the part of the employee, a change in rate does not constitute a cut. Chart 1 shows how normal pay increases and decreases under ordinary piece rate.

Differential Piece Rate—The differential piece rate consists of two rates: (1) the ordinary piece rate, which is paid a man for a normal or ordinary output, and (2) a higher rate, which is paid per piece, if a man turns out more than an ordinary output. Under the differential piece-rate system, the workman not only has nothing to fear of the rate being cut, but he has a tremendous incentive to earn high

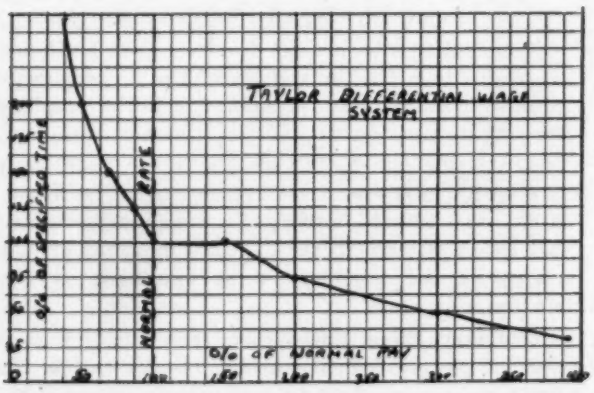


Chart II—Wage increases under differential plan at a more rapid rate as time per piece is reduced.

pay, in view of the fact that he receives an exceptionally high reward for accomplishing good results.

For example, assume that, as the result of time study, it is shown that a piece of work can be done in 15 minutes. In order to allow for necessary rest periods and avoid lost time, 60 per cent is added to the possible time, an increase of 9 minutes as an incentive, making 24 minutes the normal or average man's time. In an eight hour day we should have 480 minutes; hence, the normal average output of an ordinary man would be 20 such pieces. Under the differential piece-rate system there would now be two rates offered, say, for example, 30 cents per piece for an output of 20 or less, and 32 cents per piece for an output of more than twenty. Thus if the man produces 20 pieces, his earnings for the day would be $6.00, whereas if he turns out twenty-two pieces, his earnings rise to $7.04. The company can afford to offer the increased piece price, because the cost of operating a machine tool, including power, light, heat, rental, repairs, etc., is likely to be as great as the rate of the man who is operating the

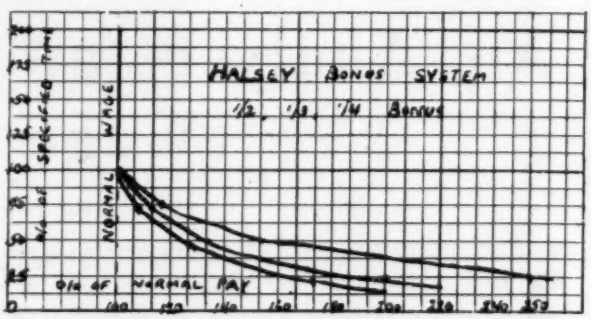


Chart III—Shows pay per piece is not reduced if more than specified time is consumed and pay is increased as time is reduced.

machine, and the day rate of the machine remains very nearly stationary while the output increases. Chart 2 shows how under the differential piece-rate the pay per piece increases at a more rapid rate as time is reduced than under ordinary piece-rate.

This last point may be illustrated mathematically. Let us assume in the above case that the cost of operating the machine is 40 cents an hour. The formula for determining the direct labor and machine cost per piece will be as follows:

$$\frac{\text{Mach. rate} \times \text{hrs.} \times \text{piece rate} \times \text{No. of pieces}}{\text{Number of pieces}} = \text{Piece cost}$$

Thus if a workman turns out only 16 pieces during an eight hour day, the cost per piece then will be:

$$\frac{35 \times 8 \times 30 \times 16}{16} = \frac{760}{16} = 47\tfrac{1}{2}\text{c}$$

If, on the other hand, a good workman turns out 22 pieces, the cost per piece will be as follows:

$$\frac{35 \times 8 \times 32 \times 22}{22} = \frac{984}{22} = 44.3\text{c}$$

From the above illustrations, it is seen that the workman who produces only 16 pieces earns $6.00 per day and the cost to the employer is 47.5c per piece. On the other hand, the workman who produces 22 pieces earns $7.04 per day, while the cost to the employer is only 44.3c. This illustrates the fact that under a properly adjusted wage system of the differential piece system, both employer and employee may profit.

Contract Work—Where work is repeated over and over again in considerable volume, the practice ex-

ists of making a contract with competent workmen whereby they are to furnish a certain number of pieces at a specified price. Under this arrangement the contractor employs his own men, while the company furnishes the material, buildings, equipment, tools, etc. Perhaps the most satisfactory reason for the employment of contract work seems to be that organized labor will submit to a brisk pace when imposed upon its members by a contractor who is himself a member of the organization.

Halsey Premium System—In the premium system devised by Mr. F. A. Halsey, the workman receives his hourly rate, and in addition to this receives extra

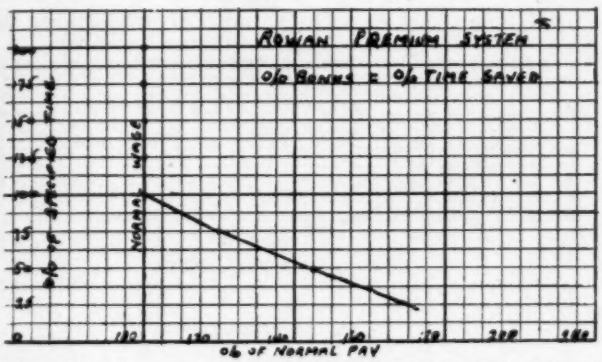


Chart IV—Shows pay remains same if the time is not reduced and how it increases as the time is reduced.

pay every time he does the work in less time than the standard time. The time standard originally used by Mr. Halsey was the average of the records of previous performance. At the present time, however, the time standard is usually taken from 40 to 60 per cent higher than the time in which a skilled workman can do the work under correct conditions, such time standards having been established by a

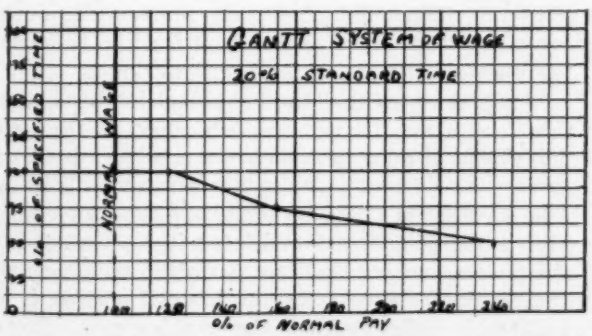


Chart V—Shows how day rate is paid irrespective of output and how pay increases as time is reduced under Gantt System.

scientific motion and time study made during demonstrations by a skilled mechanic. The method of figuring wages under the Halsey premium plan is expressed in the following equation: (See also Chart III).

Wages equals the time taken × the hourly rate × the time saved × a fraction of the hourly rate.

The usual fraction of the hourly rate is 50 per cent. Prior to the general acceptance and introduction of accurate motion and time study made on demonstration by skilled workmen as a basis of time standards, various systems were used which sought to establish a diminishing premium scale as the time was reduced below the time standard. These systems sought to provide a sort of insurance for employers who made mistakes in setting their time standards too high.

The following table shows some of the results actually obtained under the Halsey Premium Plan:

Time allowed	Time taken	Wages on job at 30c per hour	Premium 1/3 of the value of the time saved	Workmen's earnings per hour	Total labor cost of job
10 hrs.	10 hrs.	$3.00	0	.30	$3.00
10 hrs.	9 hrs.	2.70	.10	.311	2.80
10 hrs.	8 hrs.	2.40	.20	.325	2.60
10 hrs.	7 hrs.	2.10	.30	.343	2.40
10 hrs.	6 hrs.	1.80	.40	.366	2.20
10 hrs.	5 hrs.	1.50	.50	.40	2.00

The premium rate has the advantage that it does not set up fear as an incentive. Absolute guarantee should be made of the principles of time standards under the premium rate system, so long as methods, tools, and machines are not changed.

Rowan Premium System—This is a modification of Halsey's premium system devised by Mr. James Rowan. Time limits are established as under the Halsey system. The amount to be added, in case the time limit is reduced, is figured as follows: The premium equals the money value of the time actually taken to do the job multiplied by the time saved and divided by the time limit. For example, if the time limit is 10 hours for a piece of work on which is employed a man receiving 30 cents an hour, and he does the work in 8 hours, then his pay will be 8 times 30, or $2.40 for his regular time; the premium to be added will be

$$\frac{2 \times 2.40}{10}$$ or 48 cents.

Further results of the application of the Rowan Premium System are shown in the following table (See also Chart IV.

Time allowed	Time taken	Wages on job at 30c per hour	Premium money value x% of time saved	Workmen's earnings per hour	Total labor cost of job
10 hrs.	10 hrs.	$3.00	0	.30	$3.00
10 hrs.	9 hrs.	2.70	.27	.33	2.97
10 hrs.	8 hrs.	2.40	.48	.36	2.88
10 hrs.	7 hrs.	2.10	.63	.39	2.73
10 hrs.	6 hrs.	1.80	.72	.42	2.52
10 hrs.	5 hrs.	1.50	.75	.45	2.25

Under this system, no matter how far the time is reduced, the premium will never be quite as great as the regular pay at a given time, so that the workman can never double his wages. Some of the objections raised against this system are that it requires a higher grade of clerical help to figure out the premiums than is needed with the Halsey sys-

tem, also that figuring the premium is too complicated an affair for the workman, and that he will therefore become dissatisfied. Where the clerical labor and workmen are both of a high order of intelligence, these last objections will not hold good. Another objection made is on the ground that there

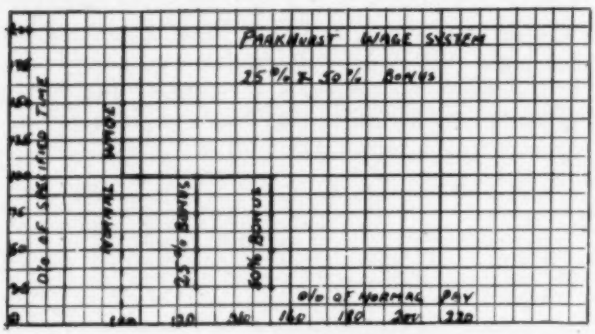


Chart VI—Shows how pay on the individual-job bonus system increases as the time is reduced.

ought to be no limit to the amount of premium or bonus which a man can earn. In reply to this, the statement is made that the management may have a very definite idea of the shortest time in which it is desirable to do a piece of work from considerations of accuracy, wear of machinery, and fatigue affecting the man.

Gantt Bonus System—In this system time standards are established, but the employee is guaranteed a certain hourly rate regardless of his efficiency. If he does the work in the standard time he receives a bonus, usually from 20 per cent to 50 per cent, depending on the nature of the work. (See Chart V).

If he does the work in less than the standard time, he receives the time rate for the standard time plus

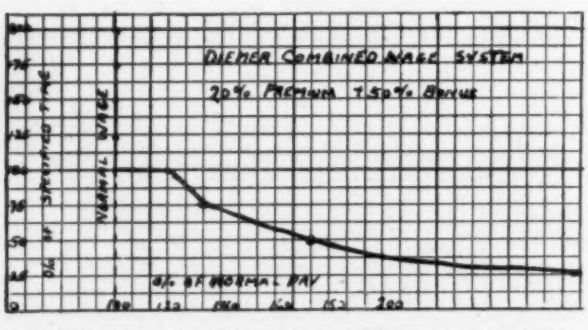


Chart VII—Shows how with a guaranteed day rate, the pay increases as the time is reduced under the Diemer System.

the same bonus. In other words, the system is virtually a time rate for the man who does the work in more than standard time, and it is a piece rate for those who reach or better the standard.

Suppose for example, that the standard time for a given job of work is eight hours, the rate of pay is 40 cents per hour, and the bonus is 30 per cent. If the man takes ten hours to do the work he gets 10 times 40 cents, or $4.00 for the job.

If he does the work in eight hours, he gets eight times 40 cents, or $3.20 plus 30 per cent in 8 hours—which is 96 cents. This makes his earnings $4.16 for eight hours, and his hourly rate is 52 cents. If it takes him six hours to do the work, he receives $2.40 for the time at work, plus 96 cents as a bonus, making his total wage $3.36 and his hourly wage 56 cents as contrasted to 40 cents in the first instance and 52 cents in the second.

The purpose of this system is to secure to the workman his earnings while he is learning the job, and then pay him a sufficiently large bonus to keep him working at his highest rate of efficiency.

In addition to the bonus paid the workmen, a bonus is also frequently paid to the foremen. The foreman's bonus varies with the number of workmen in

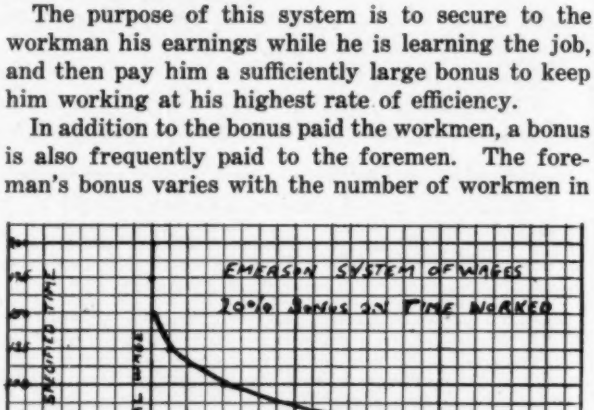


Chart VIII—Shows how with guaranteed day rate, the pay increases as efficiency increases under Emerson System.

his gang who earns their bonus; i. e., it is larger if all the men in the gang succeed in earning their bonus than if only some of them are successful.

For instance, assuming that the foreman had 10 men under him, he would get 10 cents per bonusman, or $1.00 per day, if nine of his men made their bonus. If, however, all his men made their bonus, he would receive 15 cents per man, or $1.50. This system applies the differential piece rate for rewarding the foreman. There is an inducement for him to secure the highest efficiency from every workman.

It will be noted that the individual job bonus system recognizes 100 per cent efficiency on the individual job, but does not reward a man for his effort, in case he does not attain 100 per cent efficiency. The payment of bonus on individual jobs demands a high grade of accuracy and integrity on the part of the person keeping the time record, so as to prevent the robbing of time from one job and putting it on another in order to favor the working men. Moreover, the most desirable employee is not the one who makes gains by occasional spurts, but one who averages high in efficiency. Under the individual-job bonus system there is no incentive to maintaining a uniformly high efficiency on all jobs. Chart VI shows how pay an individual-job bonus system increases as time is reduced—(Parkhurst Wage System).

Diener Bonus & Premium System—Under this system, workmen are paid a percentage increase of

their wages such as 10 per cent, etc., if they reduce below past average the time in which the work is done. They are paid 20 per cent of hourly wage increase if the work is done in a specified standard time, such standard time being based on motion and time study, or demonstration by skilled workmen, and about 20 per cent being added to this time. A further so-called "gain-sharing bonus" on the Halsey premium plan was allowed if they did the work in less than the specified standard time. In addition to the bonus wages paid, a record was kept of every man's percentage of success during pay period, and each man's percentage of success was made the basis of promotion in his hourly rate. (See Chart VII).

Efficiency System—Under this system a standard time is established for each job. During each pay period, a record is made of the number of hours a man worked on the jobs on which time standards were established. Then the total hours in which he did these standard time jobs is divided into the total sum of the time standards. For example, if the sum of the standard times in a given pay period totals 210 hours, and the man took 240 hours on these jobs, then his efficiency would be $\frac{210}{240}$ or 87.5 per cent.

Mr. H. Emerson devised a sliding-scale for determining the bonus to be paid under the efficiency system. This scale is as follows:

Per cent Efficiency	Bonus As Fraction of Wages
65	.0001
68	.0004
70	.0020
72	.0055
74	.0101
76	.0161
78	.0239
80	.0330
82	.0435
84	.0555
86	.0693
88	.0840
90	.1000

Above 90 per cent efficiency, add the percentage above 90 to 10 per cent and the sum is the fraction of the wages to be paid as bonus. Chart VIII shows how the guaranteed day rate, the Emerson system rewards for increased efficiency.

Selecting a Wage System—In conclusion, it must be noted that the type of wage system to be introduced will depend not only on the extent of standardization, but also on whether the workmen are of a high or low grade of intelligence, and whether or not they are under the domination of strict union regulations in regard to wages. In general, we may state the field of the various systems as follows:

Where standardization has not been developed very far, time work with efficiency records is appropriate.

Where standardization is under way, but has not been very well developed, the premium system is applicable.

Where standardization is fully developed, the bonus system on individual jobs, the combined bonus and premium system, or the efficiency system can be used.

Modern Machinery and Its Relation to Quantity and Quality Production

By GEORGE RICE

ANYONE who travels among the mills very much can see here and there a machine which is not producing normally either as to quality or quantity because of some mechanical fault rather than its age or state of wear. It is not uncommon to find an occasional machine standing idle in a busy plant because of the Jonah qualities which some superstitious workmen have tacked on to it. I have seen a settling floor so disable a perfectly good machine by throwing it out of plumb, that its mechanical action was faulty and its product imperfect.

Depreciation in all mill machinery necessarily is continuous and constant, and each year reduces its value. That depreciation has to be considered from the viewpoint of wear and tear and obsolescence. Such depreciation is expected and is cared for in all well managed establishments, and all such mills can finance reasonable requirements for machinery replacements when necessary. Most mills set aside a depreciation fund each year, so that at the end of a period of time this machinery replacement can be effected in a normal way.

If a machine or a number of machines are impaired by the wear and tear of years of service, or are out of date, they should be disposed of even if the depreciation fund will be seriously weakened by the draft upon it. But the abandonment of machinery which is not giving satisfaction because it is out of fix, or happens to be placed on an unsound foundation, or is driven by a belt which slips, creeps, sags and runs over on one side of the driving pulleys, is not profitable, as all mill men know.

A paper mill machinery company had installed a machine in a certain mill and complaints were received from the management that it was not operating satisfactorily. A machinery salesman who was a mechanical expert was sent to investigate. Two shafts which carried gears that had some hard driving to do were adjusted too far apart, thus allowing the teeth of the gears to almost ride upon one another. They were four-pitch gears, made of gear steel. Had they been of the old style cast iron type, they would have succumbed and the machine would have come to a stop. As it was, they slipped a cog now and then and it was this slipping that caused

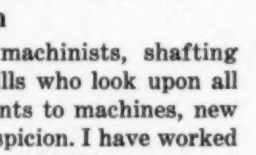
the imperfect work. Just why some member of the technical supervising force of the mill overlooked this faulty adjustment of the shafts is a puzzle, but such things have happened before even in mills in which the mechanical supervision is first-class.

The salesman quickly discovered the faulty setting of the grating, grinding gears which were struggling to do their work under a heavy handicap, and in five minutes had moved up the shaft boxes so that the gears properly meshed with the right clearance. After that there was no further trouble with the machine.

New Equipment Sometimes Viewed with Suspicion

There are some foremen, machinists, shafting oilers, helpers and other in mills who look upon all new machinery, new attachments to machines, new processes and methods with suspicion. I have worked alongside of men of this type. If things are not done the way their fathers or grandfathers did them, they think that they cannot be right. They like the old style water wheels with the applewood cogs in the gears.

They are not interested in individual or group electrical motor drives for machinery. They do not keep up with the times by subscribing for a trade journal. They make fun of anything that is written by technical experts either in the trade press or the text books. If a new machine is installed where they work and it runs smoothly from the start, they will tolerate it, but if a bolt happens to get loose and let some part slip that has to perform an important mechanical movement, they are quick to condemn. They love the old, antiquated machine which was replaced by the new one so much that it takes them a long time to adjust themselves to the modern conditions of speed and production.



Such enemies of new machinery I find best to jolly along. If the mill owner can be induced to give the conscientious objector a slight raise in pay the day he takes charge of the new machine, the chances will be that all visible discrimination will be squelched. Most mill men of all grades like a new machine the same as they like a new automobile. They will do their best to get the highest degree of efficiency from any new machine in their charge. They will be proud of it. There are, however, always a few in every mill who are fogy and believe in neither typewriting nor air flying. When a good machine is installed by a reputable paper mill machine company and does not do well under the management of a known chronic objector to modish things, it is a good idea to either cure him or fire him. The fault is not in the machine, but in the man.

Worn Parts Discredit Some Good Machines

Builders of modern machinery are competent, but none thus far have been able to design a machine, an automobile, an electric motor, a watch or any mechanical device that has moving parts, that is immune from wear. Everything that acts wears in time. Human bones would char, crumble and be in need of repair if people did not die before such deterioration happened. But a minor disintegration of a mechanical part of a machine should not interfere with the efficiency of that machine, because, as a rule, it can be corrected.

A certain paper mill manager complained to a machine building company about the work turned out by one of its machines. The machine had been running some three years, and although it was not usual to receive complaints about any machine which had been out so long, an expert was sent to investigate. Two main gears which performed a duty that put most of the work on three teeth were found to be running dry and grinding to such extent that particles of gear metal ground off from these three teeth were scattered about the frame of the machine and on the floor below. The clearance was not correct, for although the teeth meshed better than in the case of the gears above mentioned, the adjustment was such that most of the pressure was exerted on the pitch diameter line. It was a case of a good machine being retarded in efficiency of action by six worn teeth of two gears, three in each.

The expert wired back to the home office for a new set of gears. These were put on when they arrived and the expert remained to set them right. He left instructions about the proper lubricating and cleaning of the gears. No further complaints were received from that source.

This illustrates how at times small things can injure the reputation of a really good machine built by a machine company of high standing.

Minimum Size for CO_2 Recorder

OFFICIALS and owners of plants sometimes ask: "What is the smallest size of plant that can afford a CO_2 recorder?"

I have made up a rule as follows, based upon a formula that I developed:

> First, determine the durability of the recorder in years. That is, will the recorder last ten years, fifteen years, or twenty years? Whatever the number of years, divide it into 1. Then to the quotient add the interest rate on

money or the value of money. Then multiply the sum by the cost of the recorder in dollars. Then to that add $150. The saving in the plant must be greater than this amount. Unless it is greater it will not pay to buy such a recorder.

For example, suppose the cost of the recorder is $300.00, the interest rate 6 per cent, and that a recorder will last 10 years.

Then, 1 ÷0.1 =0.1 (As directed above)
0.06+0.1 =0.16 (Also as directed)
$300. ×0.16=$48. (And again, as directed)

$150. +$48.=$198, or, a saving of 55c per day for 365 days per year is necessary to make the investment in the recorder "Just come out even." If that much cannot be saved every day it is plain that the investment in a $300. recorder would be unprofitable.

The $150 given in the above rule is the estimated cost per year for chemicals and for taking proper care of the recorder. If you can reduce that figure, very good. Do it. Install a CO_2 recorder by all means if you find that you can make one pay.

Lessons in Paper Making

Lesson XXI—A Talk, Figures, and A Parable

By HARRY WILLIAMSON

Class Instructor, Champion Fibre Co., Canton, N. C.

This article is the twenty-first of a series of lessons in practical paper making, appearing each month in The Paper Industry by arrangement with the Champion Fibre Company, Canton, N. C. These lessons are a part of the general education course, conducted by this company under the direction of Mr. J. Norman Spawn, educaional director.

THE writer has been absent from these pages during the past two issues of THE PAPER INDUSTRY. During that period, we have been considering how best we could serve the interests of our readers through the medium of these few columns per month. Not only to serve the interests, but also to **hold the interest.**

To a paper maker, all phases of this fascinating evolution of raw materials into the finished product, the sheet of paper upon whose surface may be inscribed a thought capable of changing the whole trend of human activities, are interesting. Not only interesting, but if we are to produce the best, a general knowledge of those phases of operation with which we are not immediately concerned, those phases we do not specialize in to the most minute detail, is necessary.

To really make paper, to produce a product which will fill the requirements of the buyer, requirements which the buyer is perhaps unable to express in terms of manufacturing possibilities, the papermaker **must** understand the inherent and developed qualities of the raw materials; he **ought** to understand the general principles of any further process his finished paper is to be subject to. Thus equipped, the paper maker can be a real adviser to the buyer, keeping satisfied customers and incidentally saving himself much grief.

At first glance, this looks like a very large bill to fill, yet our paper grades, their raw materials and their ultimate usage, are clearly defined: Newspaper with its sulphite and ground wood, its modern high speed printing presses; the best quality of fine papers with the rag furnish, and the monogrammed writing paper on my lady's secretary; the coated supercalendered papers with their chemical pulps which are destined to portray the advantages of a "straight eight with stream lines," or give us a vivid illustration of the musical possibilities in thirty-seven varieties of soup; the utility fine papers, the bonds, library index, the tablets, the envelopes; wood pulp papers for hard service plus the finer qualities of appearance and surfacing; down the line to the hard working papers—the wrappings, then bag, not designed to please the eye or even the sense of touch, but to perform one hard duty service then be discarded to possibly again enter the cycle of the paper mill.

There are many variants of these papers, bewildering and confusing to first contemplate, yet **each forming a definite part of a definite range.** It is when we try to **get out of our range we meet disaster.** The raw materials available, the chemical and mechanical equipment of the plant define the range within which the plant can successfully operate. The chemical and mechanical equipment comprise the instruments for the "technique" of papermaking; they are the pivotal center. A thorough knowledge of the latent possibilities of the available raw materials, a general knowledge of the purpose the finished product is to be used for, will enable us to use this technique so that the interpretation, the finished sheet, will provide us not only with dollars and cents, but also leave us with that roseate glow of satisfaction which is only to be obtained from a job well and truly done.

The Machine Room

As it is with an organization as a whole, so it is with each department and each individual unit of each department. There is a necessary technique to

be mastered before we can realize a satisfying interpretation.

In these Lessons, we have endeavored to deal chiefly with those factors of fourdrinier operation which are controlled by the laws of mechanics and can be defined by mathematical formulas. Such factors as the squaring of the sheet on the winder, the setting of slitters, the guiding of felts, leverage pressure, the "crown" of press rolls, wire tension, etc., wherever possible the practical **application** has been dealt with as far as one or two illustrations can deal with such factors. As papermakers, these factors **do not comprise the whole of our art. They are merely the foundation, the technique, the fundamental principles on which we must build.**

As a pianist must master the scales and chords so that his fingers instinctively, without conscious effort, reach out for the right keys, so must we master thoroughly these factors, these mechanical principles, so that the major portion of our conscious efforts may be concentrated on the development of the latent characteristics of the raw materials. By these means, the **best results from each furnish will be produced.**

The **formation** of the sheet on the wire is the primary papermaking duty of the machine tender. To use a common machine room phrase, "give us a good sheet delivered from the wire" and we have a good weapon to fight the rest of the machine with. Conversely, a poor sheet from the wire will not be transformed into a first-class sheet by the best paper machine ever built.

The mixing of the fibers in suspension in water, the control of the delivery of this mixed volume to the speed of the wire, these are the factors which are subject to that slight degree of change, due to a variation of the stock treatment, which makes a world of difference in the appearance and some of the qualities of the finished sheet. Water valve, stock valve and slice opening—in other words, a constant watchfulness over the stock consistency of the mixed volume and the amount of this volume per second delivered on the wire. The experienced machine tender is usually well practiced in reading the flow on the wire.

The May issue of "The Super-Calender," published as a house magazine by the Pusey Jones Company, contains an interesting table showing the mathematical computation of "Slice Velocity." As their authority, they quote from the most excellent handbook written by the eminent civil engineer, John C. Trautwine, and revised by his son and grandson, the ninth edition, 1911, page 539.

Article 7. Flow through Orifices: Theoretically, the velocity (V) or speed in feet per second of a fluid flowing through a small orifice in the side or bottom of a very large vessel is equal to that acquired by a body falling freely in vacuum through a height equal to the head or depth, measured in feet vertically from the level surface of the fluid in the vessel to the center of gravity of the orifice, or stating this as a mathematical formula:

V equals $\sqrt{2gh}$ equals $\sqrt{64.4h}$ equals $8.03\sqrt{h}$ (g) being the velocity of a falling body in vacuum which is equal to 32.2 feet per second, and (h) the height. This law applies equally to all fluids; thus theoretically, mercury, water, air, etc., all flow with equal velocities from a given orifice under a given head.

Tabe 10. Velocities theoretically due to given heads:

Head in inches	Head in feet	Velocity fet per second	Velocity feet per minute
3	¼	4.01	240.60
6	½	5.67	340.20
9	¾	6.95	417.00
12	1	8.03	481.80
18	1½	9.83	589.80
24	2	11.40	684.00
30	2½	12.69	761.40
36	3	13.90	834.00
42	3½	15.00	900.00
48	4	16.06	963.60
54	4½	17.02	1021.20
60	5	17.98	1078.80

This is a very useful table. The velocities given are the **initial** velocities and are actually the **minimum** for each machine speed given.

As it is more convenient to find the actual speed of the machine than it is to check the depth of the head to the center of gravity of the slice opening, the writer offers the following mathematical formula:

If slice velocity equals $\sqrt{2h}$ equals $\sqrt{64.4h}$ equals then a **known** machine speed in feet per second divided by 8.03 will give us the square root of the height of head desired, $\sqrt{h}$.

Feet per minute	Feet per second	$\sqrt{h}$	Depth of head required feet	inches
525	8.75	1.0896	1.043	12.516
175	2.91	.362	.19	2.28

During the ensuing months, we will discuss through these columns some of the factors concerning the beating and jordaning of stock. We are, therefore, approaching that phase of papermaking which, despite the closest control, still remain very much a matter of the human equation: "Your paper is made in the beater" is quite a familiar slogan and one we have always been prone to accept in toto. Yet, is it?

In restrospect, looking back over twenty-five years of papermaking, this writer still has the grace to blush over the memories of his personal appraisal of himself at different stages of papermaking experience. As a back tender, he was quite sure that the production of the machine depended on his agility; as a machine tender, very young, he was equally sure **all** the responsibility rested on his

shoulders; as a boss machine tender, he has occasionally dwelt lingeringly on his own importance in the scale of productivity. Yet the time has been when all the agility of skillful back tenders, all the craft of smart machine tenders, all the careful nursing of stock by the boss and his beater engineers, produced anything but the desired result. Under these conditions we, one and all, ejaculate, "The d—d stock is on the bum!" and look for relief to the pulp mill.

We realize, therefore, that each of these jobs, with its attendent duties is of **relative importance**; no one of them is **all important.** Each has its technique to be mastered, the detailed operation of each department to be carried out faithfully with the **wider comprehensive view of the whole.**

As a conclusion to this little talk, these few figures, representing the close of one phase of machine room operation which we have had the pleasure of discussing together these past twenty months, the author is attaching a "Parable" he wrote for his company's house organ, "The Log".

The Parable of the Big Egg

The Ancient—Wherefore knowest thou. It is written in the heavens, Shouldst thou desire knowledge, a reading of the past, a contemplation of the present a forecast of the **future,** then verily unto thee I say: **Read thou the stars in the sky,** for the **Zodiac** telleth all things.

The Fable—Once upon a time, in a chicken yard in the land of the sky, there dwelt a goodly number of chickens. Between them existed a keen, friendly rivalry, for each desired with a longing desire, to **produce the biggest egg,** and daily did they labor to this end. Their master beholding their rivalry, did bethink him of a scheme and forthwith, when the chickens were at sleep, did he plant him in the chicken yard an **ostrich egg** of a size far beyond the capabilities, but not beyond the ambition of the barnyard fowl.

And, behold, one chicken bemused with sleep and thinking daylight had come, did sally forth from her nest into the chicken yard in search of the early worm. And she findeth the **ostrich egg.** Lo! she standeth in amazement and her chicken heart flutter-eth, not with fear—for this is a fable—but swelleth with courage, and promptly pusheth and rolleth the **big egg** on to her nest. Verily this is a fable.

She pretendeth to sleep till her sisters shall awake and behold her perched on top of an egg, the like of which they had never before beholden. And, lo!, when dawn hath come, a veritable bedlam did break loose. Cackle, cackle, **what is it?** Cackle, cackle, **who did it?** Cackle, cackle. Shades of fricassee chicken, **who helped her?** And, for a passage of time, the **big egg** chicken speaketh not, for she is a brainy chicken. Said I not, this is a fable?

Moreover, she is an honest chicken, at least she cometh by her feathers honestly, and she hath no desire to **tell a lie,** yet must her labor of rolling the **big egg** to her nest be in vain? Behold she hath inspiration. Stretching languidly from atop of the **big egg,** she preeneth her feathers while smothering a yawn born of simulated boredom. "Wherefore, listen," saith she, and copying the vernacular of an age yet to come she delivereth herself of these wise words: **"I ain't agoin ter say nuthin but, just take a squint at this and for the luv o' Pete do yer best.**

Prophecy—And a time shall come to pass when the land shall be covered with vast **ant hills** of energy y-cleped **"Industry",** each of which shall produce a commodity to be sold in the market place. And the **duplication** of salable commodity shall be so great that only **the ant hill which produceth the biggest and best shall survive.**

The Parable—Time: Four hours Past Meridian of a day in February 1928.

Place: An **"Industry"** which produceth **pulp** and **paper** in the city of **Canton** in the **land of the sky.**

As hath been recorded, the prime commodity of the **"Industry"** is **pulp** and **paper,** but there are many others, so that each fraction of the raw materials, and each particle of a fraction thereof shall be utilized for sale. To such a pass hath keenness of competition driven all **"Industry"** that a veritable **war on waste is waged.** Yea, verily until only the **odor** shall remain, and this only goeth where the wind listeth.

And there cometh into the department which produceth paper, the **chief operating ant** of this vast **"Industry".** And he regardeth the record upon which thereon is inscribed the figures which added together giveth the sum total of the paper produced. And for D machine, he readeth 36,000 pounds. And for C machine, he readeth 40,000 pounds. Therefore, he museth, this D machine hath produced a goodly egg, but this C machine hath produced a **wonderful** egg. And being blessed with an Hibernian understanding of the nature of **"Industrial" ants,** of which surpasseth in shrewdness all others, he calleth to him the **deputy chief papermaking ant** who hath at the moment arrived fresh to his duties.

And he spaketh in this wise: verily this accomplishment of the **ants** just finished with the days' labor, is of goodly proportions. A duplication thereof would please the **king ant** of this **"Industry"** beyond all understanding. Knowest thou the fable of the **big egg?** And straightway he told it to him. And he departed forthwith leaving ringing in the air these words, **"Fer the luv o' Pete, do yer best".** Then was the **deputy chief papermaking ant sore beset.** Yet he museth should we be entangled in a maze? Advice can be sought over the speaking wire from the **chief papermaking ant** and moreover, there is still the **zodiac.** So he consulteth the **zodiac** which telleth all things.

And to the **East** he beheld the star named **"furnish"** and it was bright in the heavens, reflecting the beams from the distant star **pulp mill,** drawn together by the necromancy of the **chief papermaking ant.** And it was good.

And to the **West** he beheld the star named **"mechanical and clothing equipment"**, and lo! its light was clear and clean, polished to a brightness by the **assistant chief papermaking ant** and his cohorts of the monkey wrench. And it was good.

And to the **South** he beheld the star named **"power"** and it held steady and clear in the sky promising an energy which flickereth not. And it was good.

And lastly, he gazeth to the **North** and beheld the guilding star of all **"Industry", "the co-operative effort of industrial ants"**, which for compactness has been named **"efficiency"**. And, lo! his troubles passeth away for it **was good.**

Then calling together his ants, he telleth them the fable of the **big egg.** But he warneth them. Let not the **size of the egg** be your only concern, for peradventure if it shall so happen that when the buyer shall open the egg and it **smelleth to high heaven,** then beware. For the buyer will kick the king ant and he in turn will pass on the kick until gaining momentum it shall indeed be a vigorous kick. Yea, even unto the least of you. And they grinned back at him, and girded up their loins for they knew it would be so.

And lo! when twelve midnight hath come, there was recorded the story of another egg. Even as big and as sweet as the first egg. And again, when the **third deputy chief papermaking ant** hath come, the tale is repeated and he smileth, and behind his smile is seen a purpose which portends a third big egg. And when daylight is come, lo! and behold it is so. And on the record, resteth the tale of **three big eggs.**

Now, wherefore, resteth the wisdom of this parable? Verily, I say unto you, **Read thou the stars in the sky, for the zodiac telleth all things.**

Reminiscences of an Old Paper Maker

WHEN I, an old paper maker of the Victorian era, read in The Paper Industry news of the remarkable size of modern machines and their wonderful production, I cannot but compare them with conditions existing about the time I finished my apprenticeship 62 years ago, and wonder if the present generation realizes what old paper makers had to contend with.

The men commencing work in the paper mills nowadays are about sixteen years of age and up, and generally work eight hours. When I was 9 years old, I was attending school a half day and working in the mill a half day. At 10½ years, I was working full time, twelve hours. From 12 to 25 years of age, my hours were from 6:00 A. M. to 9:00 P. M. Our relief came on Saturday when we quit at 1:00 P. M. Sometimes we worked from 6:00 A. M. to midnight.

There were factory inspectors in those days, but it was a remarkable fact that the management could always tell the day and time the inspector would be there. At such times, older men were put in our places until the inspection was over. We received more thumpings than advice from our superiors, and if we complained, we were informed that no one was put to paper making if he had been good for anything else.

As an example of production and conditions, I will describe an incident which occurred during the Christmas holidays in the year 1881. John Bentley, son of Daniel Bentley of Bentley & Jackson, machine builders, Bury, England, and myself went to the mill of Samuel Goldstraw, Chiddleton mill No. 251, Staffordshire, England. We were to fix up a felt arrangement which was expected to carry the paper from the wire and lay it on the first wet felt. When we arrived, the mill (machine room) was flooded and the men were having their holiday. The water went down in a couple of days, however, and we had things in shape for a try out to make the change. J. B. and myself had the couch roll to lift off and lift on again. I wonder how many couch rolls are in use today where two men could carry them around? The hands were brought in and consisted of a beater man, machine man and a boy of fourteen. These and the owner's son constituted the help that ran the mill. We never saw the son, and the machine tender was absolutely deaf and could not walk without the assistance of a stick and crutch. He had a slate hanging up and we wrote down what we wanted him to understand; the boy in some occult manner could communicate ideas to him.

When we got the sheet coming through (sheet was pottery tissue 3¾ lbs., 20x30—480 count Manila rope, beaten 30 to 36 hours), the paper stuck to the wire like a porous plaster. J. B. and myself fussed with the contraption all day, but could not get off enough paper to line a pill box. The machineman sat by a hot stove with a broad smile on his face, smoking continually, one eye on us, the other on his information board. The beaterman raked the stuff from under the wire. The boy, having no tail ends to chase, considered it a holiday and lost himself. Mr. Goldstraw took things like a philosopher and kept us liberally supplied with Bass's bottled ale and meat and cheese sandwiches. The experiment was a fizzle for various reasons, which more matured experience later has overcome, illustrated in the Harper, the fourdrinier and the Flying Dutchman.

The following day we put the machine back as was. When paper came through the machine, we

noticed it had a wet streak about four feet long in the center. Mr. Goldstraw said it was a small hole in the center of the top dryer. John Bentley very earnestly begged to have the machine stopped—that he would and could make it absolutely perfect in one hour. Mr. Goldstraw would not have it done, saying he was doing very well with things as they were. I believe he told us that he gave 3500 pounds for the mill when he bought it, and could sell at any time for 7500 pounds. About two years later, I was in the mill and the top dryer was still spoiling paper. Their average production was 500 pounds in 12 hours, which was taken one mile to the railroad station on a hand truck. I noticed that most all of their machinery was made for Henry & Sealy Fourdrinier by Bryan Donkin. Shortly after, I believe, this with other pottery tissue mills, was amalgamated under one company and did very well.

European Forestry

Part 2---Through England and Scotland, As Seen by an American Forester

By FRANKLIN MOON
Dean, New York State College of Forestry, Syracuse, N. Y.

This article which began in last number and will be concluded in the August issue of THE PAPER INDUSTRY, *is substantially the same as appeared in the July, 1927 special edition of The News Letter published by the New York State College of Forestry at Syracuse University, with some added deductions. It is a report of Dean Franklin Moon's sabbatical year abroad, during which he visited practically all the important forestry projects and forestry schools of Europe. The Dean has written this story for the benefit of those interested in forestry problems of the United States.*

Grateful acknowledgment is hereby made of the courtesy granted us by the New York State Printer in the loan of the halftone illustrations which accompany the complete article.—Editor.

A 27-HOUR sail from Bergen brought me to Newcastle, England, and after two months spent in countries where foreign languages were spoken it was a relief to get back to where one's native tongue was heard on every side. A three-hour journey brought me to Edinburgh and on the following day I immediately presented my letters to the officers of the local Commissioner of Forestry in Scotland. I also paid a visit to the secretary of the Scottish Arboricultural Society, which by the way, occupies about the same position in Scotland as the American Forestry Association does over here. From the hands of Mr. Galloway and his staff, I was passed over to the Department of Forestry at the University of Edinburgh. On arrival there I found that Professor Stebbins, the head of the school, was in France with his students, but his second in command, Prof. J. Lyford Pike, one of the livest wires that I met in Europe, was decidedly on the job. I spent about five hours with him, and from his Gatling gun conversation and pointed comments upon the condition of forestry education and forestry administration in the British Isles, I came away with a feeling that I had learned a great deal that was not in the guide book. This school is doing solid work and is turning out a limited number of men with sound technical training.

College Requirements High

After visiting the Forestry Department I was taken by my host through the University of Edinburgh. As far as tradition and atmosphere, particularly the latter, is concerned, we have nothing in the States that can equal it. However, without apologizing in any way or presenting an alibi, I am inclined to believe that the energy, initiative, and best of all, the spirit of team play which we find in the majority of American educational institutions, is a decidedly compensating factor. One point, however, which Professor Pike pointed out to me was that the average student majoring in forestry came to them with far better preparation than in this country. In fact, all over Europe we find a college education a privilege open to but a few, and only the best men and women have a chance at higher education.

Furthermore, in practically every forest school in Europe, I found that a certain weeding-out process had already been undergone, so that the men who came up to the forestry institution for their strictly forestry work were really select men of mental and physical maturity who knew what they were after and were there for business purposes.

A hasty tour of this beautiful city included a visit to the Royal Botanical Gardens, which I understand are one of the best in the world, greatly impressed me. It has 120 men on its staff, a splendid property containing among other collections the finest array of rhododendrons in the world. Here I found a Mr.

Hahn, a representative of the United States Bureau of Plant Industry, working under Prof. Malcolm Welsh, mycologist of the Royal Arboretum on the canker of the Douglas fir. (My understanding is that this disease has not yet reached the United States, but those at the head of the Bureau, fearing a possible invasion, planned to study it in its native heath.) A walk from the castle down the Royal Mile past the John Knox House, including a visit to Greyfriars Cemetery, with Holyrood Castle at the end, concluded my tour about Edinburgh. I visited it later in the month, but the first impression from the Castle overlooking the town from its rocky pinnacle with the vast sweep of gardens from Princess street still remains. A charming city, the center of old Scottish civilization and still the intellectual capital of Scotland.

In accordance with plans which had been laid out for us at the office of the British Forestry Commission in London, I was directed to go to Aberdeen where I met Col. John Sutherland, Commissioner of Forestry for Scotland. While he was transacting some business prior to our departure for the city of Perth, I visited the recently established forestry department of the University of Aberdeen.

Aberdeen Forestry School Novel

The plant at Aberdeen seems quite novel. The buildings were new and of the factory type construction, being one story high with a slanting roof so as to give a maximum of light. Dr. Bothwick, the head of the school, was out of town, but I had a cordial welcome at the hands of Professor Craig of the Botany Department, and Messrs. Fraser and Watson. The staff consists of four men for instruction purposes and from 12 to 15 students. Leaving Aberdeen, a splendid motor trip through the heart of Central Scotland stopping at the home of Lord Clinton, one of the forestry commissioners, near a typical little Scotch village called Fettercairn, a visit to the magnificent estate of the Earl of Strathmore, the home of the present Duchess of York, brought us to the little town of Perth where that evening I was joined by Mr. Caverhill, the forester for the Province of British Columbia.

On the following morning, we were motored out to Murthley Castle, the home of Col. W. Stuart Fotheringham. This magnificent old feudal castle, part of which at least dates back 600 years, we found to be located in the midst of a 36,000 acre estate having 3,000 acres of plantation. Here was a marvelous collection of American species and exotics from all parts of the world, 167 species and varieties in all. Quite aside from the pleasure of seeing so many trees and comparing notes concerning the growth and development of different exotics, we had the opportunity of enjoying the splendid hospitality of a Scottish household.

Some idea can be obtained of the manner in which these large estates are operated when we learn that on the estate of Colonel Fotheringham they have their own sawmill and their own timber treating plant. In fact, the great war, with its excessive demands for timber of all kinds, species and sizes, proved a boon for forestry in more ways than one. In the first place, it proved to the British Government how absolutely dependent they were upon other countries with whom they might be at war, for timber supplies and this condition prompted the government to embark upon its long time, large scale land acquisition and reforestation project. (See British forestry program.) In the same way, the demand and high prices for timber proved a boon for many large land owners, by enabling them to sell the growth of their plantations at a good figure and help the government at the same time.

Larch with Interesting History

The same day we were taken to visit the Duke of Athol's estate which adjoined that of Colonel Fotheringham. Here we saw the remains of some of the original plantations of European larch introduced by one of the ancestors of the present incumbent. It seems that one of the early Dukes of Athol, about the beginning of the 18th century, had his attention drawn to the fact that larch was a very durable wood by discovering that the remains of one of the old Viking ships was still intact because it had been built of larch. Consequently, in 1738 John, the Planting Duke of Athol, introduced European larch, bringing it from Switzerland. One of the old original trees is still to be seen and the seed from this old veteran was collected, sown and used to reforest a large portion of the Duke of Athol's estate.

Later, the Japanese larch was planted on account of its superior resistance to fungous diseases and it was on this estate that the hybrid larch, a cross between the European and Japanese species, named L. Eurolepis, was discovered. By some, this is considered merely a fast growing variety, but its rapidity of growth is quite apparent. In addition, it is said to be more resistant to canker than either. The latter, however, is not clearly proven.

Trees to Arrest Shifting Sands

A half day's ride the next day brought us to the forest on the edge of Beauly Firth, well toward the north of Scotland. Here we saw in its beginning a splendid example of dune reclamation and conditions similar to those which prevailed in the Landes region of France 150 years ago.

An area, called Culvin Sands, about 10 miles long by 3 miles wide covered by "blow-sand" has been a menace to adjoining farms and homesteads dating back as far as records go. In 1650 after a three days' storm, a large area of farm land including quite a few tenant and manor houses were absolutely submerged by the sand, and since that time the dunes

have been moving inland quite rapidly. So, following the War, the government started in the reclamation program.

To date, the Forestry Commission has planted about 1,000 acres with beach grass at a cost of $5 per acre. The object of this step is to hold the shifting sand in check, because this species of grass even though submerged will keep on growing. Having by that means reduced it to a condition of comparative quiet, they then plant pine. To date, about 600 acres have been planted with conifers of which Pinus corsicana seems to give the best results. Here, as elsewhere in Great Britain and Scotland, it seems almost impossible to do any reforestation work without fencing out the rabbits. However, on large areas the rabbits may be successfully fenced out at a cost not to exceed $2.50 per acre, although the average fencing cost is considerably higher.

Many Plantations Observed

The following day with Major Frank Scott as a guide, we were taken to inspect some of the first growth Scotch pine now being logged off. Undoubtedly, it was rather far north in Scotland and soil conditions as well as those of climate, were rather adverse. En route to Spean Bridge we saw several excellent plantations; one of Douglas fir, the best which I have ever seen; another of Norway spruce 44 years of age yielding 8,000 cubic feet to the acre —which works out by the way to 900 board feet mean annual growth.

Leaving the little station of Spean Bridge, we were dropped off at the private station of Sir John Stirling Maxwell, one of the forestry commissioners for Great Britain and Scotland. This splendid castle, Carrour Lodge, located in the midst of 56,000 acres of true Scottish highlands, afforded us another charming instance of Scottish hospitality. A comment concerning "Hieland" weather may be illuminating. During the first day we had five showers in the morning, four in the afternoon, but no one besides Caverhill and myself paid any attention to them whatever.

For about the past 35 years, Sir John Maxwell has been endeavoring to reforest a portion of his property, and his patience in the face of adverse conditions of soil and climate was really amazing. Incidentally, his experiments have yielded excellent information which the forestry commission is using to plant similar areas in Scotland.

The Highland Country Described

The picture of the Highland country around Carrour is somewhat as follows: broad valleys surrounded by long, rolling slopes, the lake level and bottom of the valleys at 1,250 to 1,500 feet; nearby mountain tops up to 3,200 feet; a cold summer climate, plenty of rain, heavy ground cover—heather, bracken ferns, etc.—acid soils. All these combined make the situation most difficult. While it is believed that originally vast forests of some scrubby sort of pine covered this region; there is not a tree to be seen over thousands upon thousands of acres of the heatherland in northern Scotland. While reckless cutting to a slight degree, may be responsible for this bare condition, nevertheless the repeated burnings during the clan battles are believed responsible for the practically treeless condition of many parts of the Scottish Highlands. Here, Scotch pine serves as a nurse tree, and Douglas fir fares well in protected locations. On the average, it costs $40 per acre to plant in this part of the Highlands, including "beating up," as they term the filling up of gaps caused by failures. From what we saw, it would appear that certain American species like Engleman spruce, western hemlock and western cedar would yield as good results as any of the native species.

Scott's Lake Region Beautiful

The trip from the Highlands to Glasgow brought us through some of the loveliest parts of the British Isles, the Lake country of Walter Scott famed in song and story. The charms and beauties of this lower part of Scotland have not been over-estimated. From Glasgow a twelve hour run by day brought us to London. A fascinating trip through some of the principal cities and through some of the beauty spots of rural England.

At London we were again most hospitably received by R. L. Robinson, and the members of the forestry commission. In company with Prof. Fraser Story, I visited the celebrated Kew Gardens, rich in prize specimens from all parts of the world and well known to every forester and tree lover in the world.

An Outline of British Forestry Program Given

A brief description of the British Forestry Program might be of interest. As I previously mentioned, the British Government having been badly caught during the Great War made up its mind that it would plant an area sufficient to supply the forestry needs of the British people for a period of three years as an emergency measure. In 1918 the British Parliament appropriated three and one-half million pounds sterling to provide for the program during the decade 1919 to 1929. Later appropriations are expected and in all their plans provide for the afforestation (of bare lands) of 1,770,000 acres during the next 80 years. (Aside from planting, it is planned to take steps to increase the yield from the 3,000,000 acres private forest which existed in 1914.) At the present time, they are planting between 20,000 and 25,000 acres each year, and hope to complete their quota of 150,000 acres of planting by 1929. One peculiar phase of their program is that in certain instances they are leasing instead of buy-

ing land. This measure was not only taken for the purpose of economy, but also certain estates needed for planting cannot be sold on account of the law of entail. The lease generally fixes the annual rental at a figure which would yield about 5 per cent on fair valuation and runs up to 99 years.

Policy Fully Justified

In spite of the fact that from the American point of view the expenses and difficulties seem quite high, nevertheless the British Forestry Commission thoroughly believes that the expenditures planned are a good investment and absolutely justified from the point of view of protection to the Government in time of war. Besides, the planting program gave employment to hundreds of men during the period of greatest unemployment.

In order to make this large planting program possible, the Commission has established numerous nurseries on a huge scale. The output of planting material during the year 1926 totaled 30,000,000 seedlings and transplants.

From London I made a visit to one of their principal nurseries at Bageshot Surrey. There on 20 acres I found 10½ miles of seed beds with 11½ million seedlings and 1½ million transplants. On this nursery, in fact throughout England and Scotland as a whole, the American Douglas fir thrives the best and considered from the standpoint of ease of planting, rapidity of growth and volume yields is their best species for planting.

Forest Products Laboratory Started

From Bageshot to the Royal Air Craft Establishment of South Farnborough was but a short motor ride taken in company with Major Oliphant, well known to our faculty. The Forestry Commission is engaged in building up their "Madison Laboratory" under the leadership of R. S. Pearson, whose long and successful career has given him a reputation as an outstanding administrator and leader of men. He is achieving remarkable results and considering the short space of time which this department has been established, the results attained are marvelous.

The trip to Oxford the following day was delightful in every way. A visit to the leading forest school in Great Britain and the Imperial Forestry Institute was a treat in itself, and the beauty of Oxford and the glamour of the colleges so rich in traditions gave me a thrill long to be remembered.

My visit to Oxford really concluded the first part of my trip and in view of the pace I had been going, I was glad that vacation time was at hand and sailed for Germany to join my family. After a few days in Berlin, we embarked for St. Jean de Luz, the famous watering place in the Basque region of France, about seven miles north of the Spanish border. After 2½ months most delightfully spent in this unique old town, we moved to Pau for the winter.

Common Errors in Belt Drives

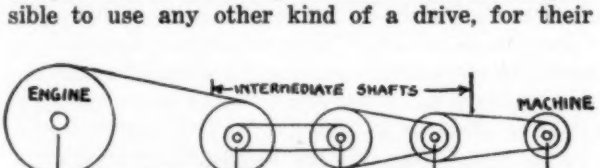
IN THE second number of the new and very interesting periodical which the publishers, E. F. Houghton & Co., No. Philadelphia, Pa., have named **Black and White** in significance of the plain language which characterizes its technical subjects, is a short article on Belt Drives, from which the following is an excerpt:

Crossed belt drives should be avoided wherever possible as they are less efficient than open drives. As the load increases, the efficiency of a crossed drive decreases.

The arc of contact is increased when the belt is crossed, and the contention is often made that under certain circumstances, the elimination of slippage due to the use of crossed drives overweighs other factors. Usually this contention is fallacious, for other factors which are not given consideration are vital, and crossed belts are detrimental. The pulleys may be too small, and beyond a doubt a high quality belt will always show to advantage on an open drive, where it is not compelled to tear its own structure down by continued friction of its component parts.

Re-Drives or "Belt Trains"

Belt trains, that is, a number of drives belted in series as shown in sketch are decidedly inefficient. They should be used only in cases where it is impossible to use any other kind of a drive, for their



inefficiency affects each successive step to a greater degree. In other words, the inefficiency pyramids at an extravagant rate, which is easily demonstrated mathematically as follows:

"If the efficiency of each drive in the illustration is only 50 per cent, the over-all efficiency of the four drives is only 6.25 per cent.

$0.50\times0.50\times0.50\times0.50=.0625=6.25$ per cent.

"If the efficiency of each drive is 70 per cent, we have $0.70\times0.70\times0.70\times0.70=0.24=24$ per cent, which is considerably better, but not good enough.

"A unit drive efficiency of 90 per cent gives us 65.5 per cent as the over-all efficiency, which is not high enough either.

"A first class belt, pulley and bearing combination will readily yield 95 per cent efficiency. In that case the over-all efficiency for the re-drive would be reduced to 81 per cent as computed in the sketch."

The Yankee Machine—Part II

By R. J. KENNEDY
Rhinelander Paper Company, Rhinelander, Wis.

This article, the first part of which was published in the June issue of THE PAPER INDUSTRY, *was presented to the class in the Pulp and Paper Course in the Vocational School in Rhinelander, Wisconsin.*

IN THE former article published in the June issue of The Paper Industry, we discussed mostly the question of refining the fibres, adding water, mixing the stock and then forming a sheet of paper on the wire.

As was pointed out at that time, the sheet of paper was actually formed on the first five or six feet of the wire. From this point on, the fundamental processes are drainage and evaporations, or the taking of more and more water from the sheet of paper until it finally winds up on the reels as dry paper.

Going back a little ways from where we left off, I would like to call your attention again to the work of removing water which the table rolls and suction boxes do. It is surprising that they remove so much water from the sheet of paper. On an 11 lb. basis weight sheet, as it flows out on the wire, the mixture is about 1 pound of stock to 499 pounds of water. By the time the paper reaches the end of the wire or the point where it leaves the wire, it is about 1 pound of stock to 9 pounds of water. In other words, about 98 per cent of the water from the sheet is removed by the wire. Of course, this figure will vary according to the extent to which the hydration and refining of the stock have been carried; asd also by the age and mesh of the wire. An old wire acts like a fine mesh wire for the reason that meshes are flattened out and many of them are filled with dirt, all of which tend toward less drainage. A new wire acts like a coarse mesh wire because it has more and better drainage.

Action of the Press Rolls

The wet sheet of paper is picked up by a woolen felt called a "top pick-up felt." This felt runs between the top and bottom couch rolls and presses out a little water as it picks the sheet of paper from the wire. From here, the felt runs through a set of press rolls and a considerable amount of water, which is still in the paper, is pressed out. The paper goes through the press rolls between two woolen felts, called the "pick-up top-felt" and the "bottom wet-felt." The mesh of the bottom wet-felt is rather open to allow all of the water to pass through, which the press squeezes out. After passing through the couch rolls, the sheet contains about 7 pounds of water to 1 pound of stock. The couch rolls remove about 2 pounds of water for every pound of stock which passes between them. After passing through the press rolls, the sheet contains approximately 2 pounds of water for every 1 pound of stock. The press rolls remove about 5 pounds of water for every 1 pound of stock.

One Large Dryer

After passing through the press rolls, the sheet of paper still sticks to the top pick-up felt and then passes between the rubber covered pressure roll and is pressed hard against the dryer. At this point, the sheet of paper leaves the pick-up felt and sticks to the dryer, following almost all way around until it strikes the doctor. The doctor is a sharp steel or brass blade which scrapes or peels the paper from the surface of the dryer. The dryer is like a large steel drum. The surface is finely polished to give a gloss or glazed finish to one side of the paper. This is called M. G. paper or machine glazed paper. The dryer is heated with steam so that the wet paper which sticks to the dryer at the pressure roll is dry paper by the time it reaches the steel doctor blade on the other side of the dryer. The paper is called dry, but as a rule it still carries about 5 per cent moisture. As the paper only carries 5 per cent moisture after leaving the dryer, the amount of water evaporated is about 1.95 pounds for each 1 pound of paper.

Felts and Crowning

The "pick-up felt" used on a tissue machine is a closely woven, fine wool felt with the outside nap singed close. By having a smooth surface, the felt will pick up the sheet better. These felts are thick and made heavy to stand the wear they are subjected to. There are very heavy woolen threads running lengthwise of the felt to give it tensile strength. At times, the pull or strain on these felts is very great. Under good conditions, these felts will stand a lot of wear, but once they get bruised or cut, they go to pieces fast. They are made endless and are kept clean by continuous washing with a shower pipe with warm water.

The bottom "wet-felt" is a rather coarse woven woolen felt through which the water is pressed as the sheet passes through the press rolls. It is continuouly washed and then the water pressed out at the queeze rolls so as to be clean and fairly dry as it reaches the press rolls each revolution.

The bottom couch roll is brass and the top roll is wood so as to be light in weight. As the top felt passes through between the two rolls, the felt picks up the sheet from the wire and also presses out some

of the water. From here, the sheet is carried between a brass top press roll and a rubber bottom press roll between the two felts. This is the last pressing out of water that the paper gets.

The rubber press roll is made with a soft rubber covering so as to give a maximum of pressing for the removal of water and still have resiliency or cushion enough so the felts will not be damaged or worn too fast. Press rolls are made of several different densities of rubber; that is, different degrees of hardness. It is largely a matter of opinion which is the best to use.

It is highly important that the rolls press exactly the same all the way across the roll. In order to accomplish this, the rolls must be ground with a crown; or in other words, they must be larger in the center than they are on the ends. This is necessary because the rolls sag or spring in the center. It is important that these rolls press the same all the way across the sheet. It is a difficult task to determine the exact amount of crown for these rolls, because the crown will vary according to different conditions such as the density of the rubber, the strength of the roll, the diameter of the roll and the leverage or weight applied to each side of the press rolls.

Quick Drying on the Yankee

As only one press is used on a Yankee Machine, the sheet must be pressed hard in order to get as much water out as possible. If the stock is free, the water presses out easily, but when the stock is too slow (hydrated too much) the water does not press out well. The felts get filled up and make holes in the paper.

The sheet of paper is pressed against the dryer with a rubber pressure roll which is screwed up tight by means of levers and handwheels. This roll is the same kind of a roll as a rubber press roll. It is also crowned to make up for the springing caused by the pressure applied to the ends. This sheet must be dried while it makes the revolution on the dryer. Steam is used to heat the dryer and a drying hood is fitted over the dryer to provide plenty of hot air to help dry the paper quickly. With a machine running from four to five hundred feet, the paper must be dried in a hurry on one dryer or it does not get dried.

The sheet of paper is then wound up on large five-foot diameter reels. It is next run over the rewinder and cut into rolls of various sizes according to what the order calls for.

Responsibility of the Machine Tender

About the most important requirements in the finished product of a tissue machine, or any other paper machine, such as a roll of paper or sheet of paper, is uniformity. A good quality sheet of paper must be uniform in color, strength, basis weight, sizing, tear or any other certain qualities the customer asks for; and because we must maintain uniform quality, it is necessary to have steam gauges, tachometers, thermometers, ammeters, and checks of one sort or another so that any variations in the mechanical processes all along the line may be found and corrected before any serious break in quality or production takes place.

In order that these instruments may follow a line which indicates that conditions are right for quality, we must have men and brains. Without the brains to guide and control this power and machinery and stock, we would not have quality very long. In these days, machinery actually does much work that men's brains used to do. The adding machine is one example. It is said that a 20,000 ton ship made the trip from San Francisco to Australia on an even keel without being touched by human hand so far as guiding the ship was concerned. This was accomplished with an electrical gyroscope built for this purpose.

In the paper industry, machinery has been invented to do a great deal of the work now. Perhaps it is not going too far to say that in a few years the papermaker will have nothing more to do than press a button for the control of the entire process. No doubt some brainy papermakers are working out such plans now. All the way along, conditions must be kept uniform or nearly so. If the jordan does not run steadily, the formation and strength of the sheet will not stay up. If the wire or felts are dirty in spots or streaks, the paper cannot be even as to drying. If the press rolls and couch rolls are not pressing perfectly even, there will be trouble again and should the dryer have streaks or spots that were not true, the uniformity of the paper would again be spoiled. As we said before, we must have brains to control these conditions, or in other words a machine tender who can and will check up and handle the controls.

The machine tender has a very responsible job. He is very much like a doctor or physician. There are many things that may go wrong on a paper machine any one of which may cause trouble at times. Oftentimes the machine tender must diagnose the symptoms in much the same fashion as a doctor does in case of sickness. He sees the symptom but he mut find the cause of the trouble before he can remedy or fix it. Here is where thought and brains come in again.

The old saying that "a chain is no stronger than its weakest link" is just as true on a paper machine as any other machine. It does not take much of a weak, broken link in the form of stock, clothing, machinery or men to cause loss of quality and production.

Here is something for the foreman to remember —Loyalty of the employee is the result of confidence in the employer.—Making Paper.

Current Thought by William Sibley

Co-operative National Advertising

LAST month I briefly discussed a few of the ways in which I believed it possible for individual mills to increase the volume and better the grade of their advertising. There might much be done along this line. Indeed, much **must** be done before any great percentage of our commercial paper mills can realize anything like an adequate return on their advertising dollar. Sometimes I am of the opinion that if more of our mills would undertake and carry forward an intelligent, scientifically prepared sales promotion plan, that many of our current troubles would vanish. Properly executed and capitalized, advertising can be made of such force that it will carry much of the burden of wasteful practices, over development and executive shortsightedness. Thinking on this subject further, I frequently come to the belief that additional and higher grade sales promotion by individual mills would obviate all necessity for even the thought of co-operative, group advertising.

Co-operative, industrial advertising is the result of two things: (a) changing industrial and social conditions and (b) impotence on the part of the individual members that make up the group. To illustrate:

Our constantly changing social and industrial standards have brought about the development of thousands of synthetic products heretofore unknown. The adoption of some of those products literally undermined the demand for established products—lumber, for instance. To meet this outside, extraneous competition not only the lumber industry as a whole but the several divisions of that industry were forced to nationally advertise, as a group, the only product they had to sell—wood. Here is a case where might be found complete justification for my statement of several months ago:—". . . . . our mechanical development is making it increasingly imperative that we readjust our advertising and selling methods in order that demand may be increased to sufficiently absorb production."

Another instance that will serve to illustrate the necessity of co-operative advertising as a cure for individual impotence will be found in the candy and confectionery field. I do not believe I am acquainted with an industry that is more demoralized, from the standpoints of merchandising, distribution, profits and over-production than the candy industry. Precious little love is wasted between the manufacturers and the jobbers while the distribution problem has never been attacked, let alone solved. Individually the manufacturing members of that industry are impotent to solve their own problems—with the result that their business has been on the down grade ever since the fruit and food product producers started aggressive sales promotional work. After all, the American people have only one stomach and if that stomach is partly filled with oranges, raisins, bananas and bread there will be smaller space for candy. Finally recognizing this basic fact, but being unable or incapable of coping with it individually, the candy industry entered upon a co-operative, national advertising campaign. It was, in short, the penalty they had to pay for individual impotence and inability.

It may be that the paper industry is not so seriously affected by the new and strange factors that have been so disturbing to such lines as lumber, shoes, dry goods, groceries, food products, or millinery. It may be that the advertising and sales managers within the paper industry are not driven by the engineers and production men in the same way that are the advertising and sales managers of automobiles, radio, electrical appliances or furniture. It may be that the paper industry is "different," but, as Jimmie Riley would say, "it sticks in my crop" that paper manufacturers could advantage themselves greatly by more fully recognizing present day tendencies in distribution and that they could sell more paper if they analyzed their advertising and sales promotional effort in the light of modern conditions.

Major O. M. Porter, Secretary-Treasurer of the American Pulp & Paper Association, writes me:

"I am convinced that the time has come when the paper industry should pool its financial support for

the development of both a centralized research laboratory, in which fundamental research on cellulose and paper could be carried very much further than is possible in the laboratory of any single mill, and with this a market research bureau which could build on the discoveries of this laboratory for the development of new uses for pulp and paper so as to expand the present demand, thus relieving over-production and increasing the profitableness of the industry's operation. This research and the new uses developed would then, of course, be given adequate publicity and whatever national advertising might appear desirable to supplement that of those companies whose equipment warranted their applying the results of such research to their own production and channels of distribution.

With an industry as diversified as that represented by the American Paper and Pulp Association, particularly where its organized activities are on an entirely voluntary basis, it is very difficult to bring about a general appreciation of the necessity for effective unified action. I am convinced, however, that in order to meet the competition of other industries and their nationally advertised products it will be absolutely necessary for the paper industry to develop its own research and its own new uses and then to create new markets through adequate publicity and advertising."

Even though it should be my province (which it is not), it is obviously impossible for me to here analyze the advertising problems of the paper industry. Our field is too ramified to permit of such analysis. There is too wide a gap between bond paper and box board or note paper and newsprint to afford any similarity in advertising problems. From the standpoint of fields reached, the media to be employed and the methods of advertising required, there is no more similarity between the problems of some members of our industry than there is between the sales promotional problems of the haberdashery manufacturer and those of the electric hoist maker.

It must be apparent, however, that great and lasting good might be gained first, through the adoption of the comparatively new co-operative idea, and second, through the overthrow of many time-honored but nearly obsolete methods of individual company advertising and the adoption of advertising methods dictated by present day tendencies.

Co-operative Effort

At the present time there are more than 80 industries carrying forward promotional effort on a co-operative basis. These many groups range from makers of disc wheels to growers of bananas. The story of their success or failures may be read by all who are interested. In a few cases, co-operative advertising effort resulted only in worry and financial loss. By far the majority of cases, however, co-operative activity proved highly beneficial and profitable. Certainly, co-operative effort of this kind is here to stay until a better medium for overcoming extraneous competition has been developed.

But, it has been said, with the paper industry so ramified, how can co-operative or associational activity be successfully applied? Answer: in exactly the same way the steel industry has used co-operative sales promotional effort. The steel industry has a diversity of interests even greater than our own. The gaps between rails and tin plate or between barbed wire and shapes are as wide as any gaps found between varying paper products. But the steel industry has employed co-operative advertising effort to excellent advantage by the simple expedient of first dividing the industry into its several logical divisions.

An even more closely comparable condition may be found in the lumber industry. Here not only does the lumber industry as a group advertise the merits of wood but the individual groups of the Walnut Manufacturers' Association, the California Redwood folks, Hardwood Manufacturers, Louisiana Red Cypress, Northern Hemlock, Northern White Cedar, Oak Flooring Bureau, Southern Cypress Manufacturers, Southern Pine Association, Western Pine Manufacturers, and many others are separately carrying forward very resultful campaigns of their own. There is a lesson and splendid experience here for the paper industry. Not only should the members of the A. P. P. A. levy themselves toward the pooling of a fund to nationally advertise paper as a product but many of the individual associations—the bond paper folks, newsprint people, boxboard producers, etc., etc., etc., might with even greater profit enter upon their own separate campaigns to augment the demand for their particular product.

Doing this would not so much mean taking business away from one section and putting it into another as it would mean helping **all** concerned. Advertising cypress not only sells more cypress but helps sell the basic lumber idea and in that way actually helps build the demand for pine, walnut, fir, and others who seemingly are competitors. Advertising bond paper will increase the public's appreciation of and demand for bond paper, but simultaneously it will also sell **paper** with the result that the entire industry will benefit.

The Gain in Co-operative Advertising

It has been asked, with sound reason, just how much return might be expected from an investment in co-operative national advertising. That is a question impossible to answer. We have only our abilities and judgment to guide us in any expenditure and since we are not buying a tangible but rather an intangible something—with no assurance whatever that our efforts will be successful—there can be no answer given.

Just suppose, however, that the members of the A. P. P. A. should pool a certain fund and start on advertising and publicity campaign tomorrow. The members of the A. P. P. A. are producing in the aggregate ten million tons of paper annually. That tonnage is purely a "round" figure set up to permit the establishment of a hypothetical case. Producing ten million tons a year, each member subscribes to a levy of 5 cents a ton—another suppositious figure. Such a levy would throw into the pool a total of $500,000 a year. (It might easily be 1 cent a ton and a $100,000 total; .025 cents a ton and a $250,000 total or 10 cents a ton with a $1,000,000 total—I am merely setting up this 5 cent levy to provide a figure on which to base preliminary calculation.)

Assume an annual production of ten million tons, a levy of 5 cents a ton and a centralized pool of $500,000 a year, and the advertising campaign started. Over the course of a year or two increased demand is noted. Assume for instance that this increased demand is only 5 per cent. Such a demand would mean an increased business of 500,000 tons. That tonnage has a manufacturing value of over 20 million dollars and a retail value of nearly 50 millions. That is the value gained on a 5 cent (or $500,000) expenditure. It must be apparent from this calculation that the ratio of the 5 cent investment on present tonnage would be infinitesimal when calculated against the increased tonnage it might bring. This same sort of calculation can be carried out on any accepted levy and on any accepted percentage.

Furthermore our present mill equipment can take care of all such increases in demand without the expenditure of a dime for new machines. This means that the added tonnage brought in by expending the 5 cent per ton would be produced at a lower cost, and a subsequent higher margin of profit, than present business. Or—if this lowered cost was reflected in prices, the decreaed price would effect a still greater consumption of paper which increased demand must be credited the 5 cent levy.

Modern Conditions

Yesterday's advertising policies do not—cannot—meet with the same success as formerly. Distribution channels, buying thought and purchaing power have all changed since yesterday. By the same token they still further will be changed tomorrow.

The background for any intelligent examination of advertising in these days must include a recognition of modern conditions of supply on the one hand and modern conditions of demand on the other. Fundamentally these may be entirely like those conditions on which the generally accepted economic principles are based, but in their external expressions they show complexities and modified interactions which are relatively new. First of all there is the pressure of all those many influences, in addition to any actual demand for the product, tempting producers to over-supply. Available capital, efficient equipment, a fluid labor supply, easy access to huge markets, a fair supply of administrative brains, and above all plenty of stimulating examples of success, are the sort of incentives constantly at work leading to over-production. In the second place, many influences of a new type—quite aside from advertising—are at work modifying what might be called the "natural" course of demand. Travel, wide circulation of magazines and newspapers, the reading columns of which command a large following, the moving picture, the radio, the automobile, the country club, the tempting offers of well stocked stores, the larger surplus for free spending, all makes the consumer's will a thing moved by many influences outside of his actual needs.

It is against this background that advertising of the modern type must be examined. These things would all go on if nobody made any effort to reach consumers with advertising messages. Increased demand cannot be gained today by hesitant coaxing. It must be sought aggresively and with a well directed headlong plunge. Consumption is no longer a thing of needs, but a matter of choices freely exercised. The consumer's dollar is not a coin wholly mortgaged to the necessary task of providing a bare living. It has in it a generous segment to be spent at the consumer's own option as to what he will buy, and when he will buy, and where.

Just one final word regarding this most needed sales promotion effort—a word that has for its background several years of study and active interest in co-operative advertising.

Do not enter into any co-operative national advertising campaign without committing yourself to at least a three year plan. Five years—preferably. Why? "Heaven is not attained at a single bound—." The true and lasting results to advertising are cumulative, not spontaneous.

Temperature Limits

BY USING alloy steel, steam temperatures of 1,000 deg. F. are now possible. The trend is still upward.

With ordinary steel, engineers have advanced cautiously for fear the steel would fail owing to the loss of strength at high temperatures. All metals lose strength with increase in temperature. However, it has been found that even steel is safe at higher temperatures than has been supposed. By mistake, temperatures have been allowed to go considerably higher than the so-called safe limits. This has occurred in a number of plants and the high temperatures have continued for long periods. Yet the steel showed no signs of fatigue or damage. Nevertheless, don't grow careless.—Schaphorst.

The Paper Industry 1928 Safety Contest

May Scores Only

47 Mills Make Perfect Score

PERFECT SCORES

	PARTICIPANT	MILL	RATE
Group A	Kimberly-Clark Co.	Kimberly	Wisconsin
	International Paper Co.	Otis	Chisholm, Maine
	Champion Coated Paper Co.	No. 2	Hamilton, O.
	Northern Paper Mills	Green Bay	Wisconsin
	Kimberly-Clark Co.	Niagara	Wisconsin
Group B	St. Croix Paper Co.	Woodland	Maine
	Nekoosa-Edwards Paper Co.	Nekoosa	Wisconsin
	Mead Fibre Co.	Kingsport	Tennessee
	Rhinelander Paper Co.	Rhinelander	Wisconsin
	Birt & Son, Inc.	East Walpole	Massachusetts
	Falls Manufacturing Co.	Oconto Falls	Wisconsin
	International Paper Co.	Piercefield	New York
	Finch, Pruyn & Co.	Glens Falls	New York
	Hollingsworth & Vose Co.	East Walpole	Massachusetts
	Sorg-Oglesby-Smith Paper Co.	Sorg	Middletown, O.
	Bryant Paper Co.	Kalamazoo	Michigan
	Strathmore Paper Co.	No. 1 Mittineague	Massachusetts
	American Writing Paper Co.	Crocker	Holyoke, Mass.
	Crocker McElwain Co.	Holyoke	Massachusetts
	Strathmore Paper Co.	No. 2 Woronoco	Massachusetts
Group C	Bird & Son, Inc.	Phillipsdale	Rhode Island
	Gardner & Harvey Co.	No. 2	Middletown, O.
	Kimberly-Clark Co.	Atlas	Wisconsin
	American Writing Paper Co.	Parsons	Holyoke, Mass.
	International Paper Co.	Webster	Orono, Maine
	Franklin Board & Paper Co.	Franklin	Ohio
	American Writing Paper Co.	Windsor	Windsor Locks, Conn.
	Gardner & Harvey Co.	No. 3	Middletown, O.
	Strathmore Paper Co.	No. 1 Woronoco	Massachusetts
	American Writing Paper Co.	Dickinson	Holyoke, Mass.
	Warren Manufacturing Co.	Hughesville	Riegelsville, N. J.
	International Paper Co.	Livermore Falls	Maine
	Kimberly-Clark Co.	Neenah	Wisconsin
	American Writing Paper Co.	Mt. Tom	Holyoke, Mass.
	Strathmore Paper Co.	No. 2 Mittineague	Massachusetts
	Union Bag & Paper Corp.	No. 5	Hudson Falls, N. Y.
	Sorg-Oglesby-Smith Paper Co.	Smith	Middletown, O.
	United States Gypsum Co.	Gypsum	Ohio
	International Paper Co.	Riley	Maine
	American Writing Paper Co.	Wauregan	Holyoke, Mass.
	American Writing Paper Co.	Platner-Porter	Unionville, Conn.
	Defiance Paper Co.	No. 2	Niagara Falls, N. Y.
	Warren Manufacturing Co.	Reigelsville	New Jersey
	United States Gypsum Co.	No. Kans. City	Missouri
	Lincoln Pulp & Paper Co.	Lincoln	Merritton, Ont., Can.
	United States Gypsum Co.	Lancaster	Ohio
	Robertson Paper Box Co.	Rockland	Montville, Conn.

IMPERFECT SCORES

GROUP A				GROUP B				GROUP C			
		Points				Points				Points	
Key	Rank	Credit	Debit	Key	Rank	Credit	Debit	Key	Rank	Credit	Debit
A- 8	6	486.045		B-35	14	451.400		C-13	30	299.300	
A- 7	7	464.030		B-21	15	424.730		C-16	31	275.245	
A-11	8	413.985		B-23	16	392.655		C-38	32	228.555	
A-14	9	405.885		B-28	17	332.770		C-11	33	205.000	
A- 4	10	390.200		B- 5	18	324.130		C-37	34	148.015	
A- 6	11	373.855		B- 7	19	305.855		C-17	35	107.570	
A-23	12	322.515		B- 3	20	298.085		C-41	36	103.985	
A-22	13	287.730		B-24	21	282.245		C-18	37	97.870	
A- 5	14	281.230		B-26	22	274.545		C- 5	38	74.645	
A-25	15	239.600		B-12	23	68.555		C-53	39	71.200	
A- 1	16	150.085		B-31	24	10.030		C- 4	40	70.700	
A-13	17	88.970		B- 6	25		27.015	C- 9	41	64.885	
A-24	18	36.270		B-36	26		33.745	C-43	42		3.185
A-16	19		143.655	B-17	27		49.470	C- 7	43		78.945
A-20	20		147.955	B-34	28		151.055	C-51	44		150.145
A- 2	21		157.530	B-30	29		295.630	C-19	45		159.445
A-26	22		161.815	B- 2	30		442.800	C-12	46		168.745
A-18	23		276.885	B-32	31		544.700	C-49	47		213.485
A-21	24		755.715					C-50	48		219.445
								C-59	49		322.070
								C-21	50		345.755
								C- 1	51		355.300
								C-23	52		369.330
								C-28	53		402.630
								C- 3	54		921.355
								C-31	55		960.245
								C-52	56		1026.300
								C- 8	57		1064.115
								C-22	58		1442.130
								C-33	59		1585.430
								C-24	60		2531.645

Reports Outstanding
A-17 B-29

THE PAPER INDUSTRY acknowledges with apologies an omission in the accumulative perfect scores of the 1928 Contest, which appeared in the June issue. The name of the St. Croix Paper Co., Woodland, Me., should have been listed as a Group B mill having a perfect record from January 1 to April 30. Not only has the mill also gone through the month of May with a perfect score, but it is reported that they have finished the term of the contest without a lost time accident.

Safety Stunts Stimulate Employee Interest

Some months ago the various departments of the United States Gypsum Co., Fort Dodge, Iowa, organized a "Safety Stunt" contest, the whole being part of a concentrated safety campaign, and each department tried to out-do the others in weird or unique ideas. One department manufactured a home-made cannon and bombarded "Fort Accident" with "safety shells." Another erected a scaffold and hung the body of "Carlessness" with great enthusiasm. Another idea, was a cage containing the "Accident Devil," and the party being on the way to an old-time frontier "lynching bee." The whole heart of the plan is, of course, to be successful in keeping up the interest of all the employees in safety work.

The Paper Industry 1927 Safety Contest

Accumulative Severity Rates of Mills in Group C, as of May 31, 1928

Participant	Mill	Rate
Kimberly-Clark Co.	Neenah	0.
International Paper Co.	Riley	0
U. S. Gypsum Co.	Gypsum	0
Kimberly-Clark Co.	Atlas	.07
International Paper Co.	Webster No. 9	.11
The Upson Co.	Board	.17
Gardner & Harvey Co.	No. 1	.17
Gardner & Harvey Co.	No. 3	.17
Adams Bag Co.	Chagrin Falls	.24
Bergstrom Paper Co.	Neenah	.25
International Paper Co.	Winnipiseogee	.31
Gardner & Harvey Co.	No. 2	.31

Participant	Mill	Rate
International Paper Co.	Livermore	.42
Lincoln Pulp & Paper Co.	Lincoln	.45
Robertson Paper Co.	Montville	.47
Union Bag & Paper Corp.	Allen	.49
Union Bag & Paper Corp.	No. 5	.49
Lincoln Pulp & Paper Co.	Lyteter	.61
Itasca Paper Co.	Minnesota	.64
Mead Pulp & Paper Co.	Peerless	.76
Union Bag & Paper Corp.	Penimore	2.49
Northwest Paper Co.	Brainerd	2.60
Lincoln Pulp & Paper Co.	Sulphite	3.07

Group A—Nekoosa-Edwards Paper Co., Combined Mills .61

Group B—International Paper Co., Niagara Falls .25

Joint Cost and Technical Meeting

Cost and Technical Men from Wisconsin, Illinois, Indiana, Ohio and Michigan Hold Joint Meeting at Kalamazoo on June 22 and 23, 1928

THE Paper Technologists Club of Kalamazoo, and the Kalamazoo Valley Division of the Cost Association of the Paper Industry acted as hosts on June 22 and 23, 1928 to an interstate meeting of technical and cost men. The meeting was held at the Park-American Hotel, Kalamazoo, Mich., and in all respects was most successful. Such a meeting was a new departure from the accustomed ways of meeting—local divisional meetings or national, and certainly served to tie more closely the interests of all of the technical and cost men of the Middle West. Invitations were extended to technical and cost men in Wisconsin, Illinois, Indiana, Ohio, and Michigan. The number that responded to the call of the Kalamazoo papermakers is indicative of the interest in both technical and cost work in the paper industry.

The Paper Technologists Club and the Kalamazoo Valley Division of the Cost Association are to be complimented upon their initiative, and thanks are due to those serving on the committee for this meeting whose untiring efforts only made such a meeting possible. The committee for the meeting was composed of H. C. Bradford, chairman, Rex Paper Co.; C. B. Barton, Jr., Michigan Paper Co.; A. C. Dreshfield, Western Paper Makers Chemical Co.; Ivar Lundbeck, Lee Paper Co.; E. F. Whittington, Standard Paper Co. and N. J. Cowie, Hawthorne Paper Co. Likewise, thanks are due to the executives of all of the mills in Kalamazoo and vicinity who threw open the doors of their plants so that all who came could see.

Registration was completed on the morning of June 22, and a joint session of both technical and cost men was called together at 1:15 P. M.

JOINT SESSION AT OPENING

E. G. Milham was introduced by Ivar Lundbeck, chairman of the Joint Session, who spoke briefly on the significance of the meeting. Mr. Milham mentioned the total cost of time or such a meeting as well as expense to the mills and firms represented. He also mentioned the moral responsibilities of each one in attendance to the companies represented for the time spent at such a meeting. He expressed the greetings of the Kalamazoo group to those in attendance away from home and then introduced F. C. Stamm of Bryant Paper Company, Kalamazoo, who spoke on "Power Costs" in a most interesting and convincing way.

Power Costs

Mr. Stamm first mentioned the importance of George K. Gibson's statement recently made before the convention of pulp and paper mill superintendents at Pittsfield, Mass., in which Mr. Gibson brought out the fact that there was an overproduction of 2,500,000 tons of paper during 1927. With such competition as exists today, said Mr. Stamm, it is necessary for a mill to have accurate figures on what it is costing to make their product in order to determine at what price they can afford to take an order and yet make profit. In Mr. Stamm's opinion, many mills are still living in the period of 1915-1920 when accurate costs were not too important.

He stressed the importance of power in the manufacture of paper. In comparing with the steel industry he emphasized the point that for every million dollars invested in steel mills there is used 1562 h. p., while in the pulp and paper industry for every million dollars invested there is used 2143 h. p. The paper industry, therefore, leads all the industries in the consumption of power per unit of capital invested.

Steam and power in the average mill will amount to 35 per cent to 40 per cent of the total conversion cost, while labor will come to only 20 per cent. Mr. Stamm believes that the difference between power costs in various mills will come to $6.00 to $7.00 a ton and that the chance for loss and waste in the power item is larger than in any of the others. Likewise, it is this item that will lend itself to produce the biggest saving with the least amount of money and effort. He explained that the problem of reducing power costs becomes more a matter of management than of engineering and discussed briefly the importance of flow meters in a boiler room, use of scales for weighing coal, and the use of a combustion indicator such as a CO^2 recorder or a Bailey meter. A CO_2 recorder, according to Mr. Stamm, will show from 10 per cent to 500 per cent on the investment.

Steam piping installation and radiation losses were also discussed. Many piping installations have been made carelessly and he suggested a simpler installation through the use of one main down the center of the mill from which branches can be extended to the places where steam is to be used. He mentioned the work of Mr. McMillan, who while at the University of Wisconsin, prepared a complete tabulation which showed that pipe covering will return from 700 per cent to 1100 per cent on the investment, and stated that for every dollar spent in pipe coverings there is a saving of nine dollars worth of coal per year.

Heat Transfer in Dryer Unaffected by Water—Drying and ventilation in relation to the part they play in the determination of the final cost of power were also discussed. One important statement of Mr. Stamm pertaining to heat transfer in a dryer was to the effect that water in a dryer does not materially affect its rate of heat transfer. A careful study of dryers in operation has convinced Mr. Stamm that the thermal efficiency of a dryer filled with water but free from air is not affected by the presence of the water.

Mr. Stamm also recommended the study of numerous small items which enter into the total cost of power and mentioned one incident where the cost of lubrication was reduced from $17,000 to about $8,000 a year.

The importance of power costs to the engineer and the management next received his attention. He stated that in the average American mill that it is possible to reduce the cost of power from 30 per cent to 50 per cent. The use of exhaust steam and method of charging it out in relation to power costs and process work, likewise received consideration.

Mr. Stamm summarized his remarks by stating that a mill, if it is to compete today, must have its conversion cost cut to the bone; accurate cost figures are necessary to show where waste occurs; steam and power in average mill is larger item than labor and offers greatest opportunity for saving with least expenditure of time and money; management should use power costs to check operation of the department and also as guide to installation of new equipment; and the larger and more subdivided the mill, the more careful must the cost distribution be made.

Mr. Stamm's paper received a hearty response from the listeners and many questions were asked about means of reporting power costs, place of engineer in the work of the operating man, and the need for cost engineers in the industry.

Following the questions, Mr. Lundbeck stated that the later meetings of the day were to be sectionalized and the meeting was adjourned at 2:00 P. M.

SECTIONAL MEETINGS

At 2:30 P. M., both the technical and cost sections called their individual meetings together with Ivar Lundbeck as

chairman of the Technical Section and N. J. Cowie as chairman of the Cost Section.

Technical Meeting of June 22

Two papers, one entitled "Cutting the Diamond" by Allen Abrams, technical director, Marathon Paper Mills, Rothschild, Wis., and the second by R. G. MacDonald, secretary of the Technical Association, entitled "Interesting Technical Problems," were presented before the Technical Section.

Allen Abrams on Technical Training—Mr. Abrams stressed the importance of thinking scientifically and the importance of scientific methods and organization in every detail of work. To be progressive, it is necessary to be in contact with those who are doing things. He also mentioned the importance of making the public technically minded and questioned "Why not the engineer in public life?" Continuing, he emphasized the need for technical men and explained that incompetence was disastrous. He also mentioned the experience of industry with college graduates and suggested that the technical man learn to talk to the financier in his own language.

Macdonald on Technical Problems—Mr. Macdonald in his paper "Interesting Technical Problems" told of the service to members plan of the Technical Association and of the interesting problems which through it are brought to the attention of the industry. Replies to questionnaires developed from the problems brought to the attention of the industry through the service to members plan, are never abundant. Some of the problems mentioned involved the use of coated papers which gave trouble when fed to the printing press, and a discussion of the use of silicate of soda, glue and gutta percha for splicing supercalendered paper. The silicate of soda was said to cause wrinkles, while the glue tape makes a smooth splice, and gutta percha gave trouble in the beater with broke. The use of sulphite gummed tape with animal glue as the adhesive was recommended. Silicate of soda which marks the paper can be used if used carefully.

Slime troubles were also mentioned and copper sulphate recommended as a coagulent. It was likewise stated to clean the piping with water since the use of lime or soda ash might cause trouble in sizing. The use of white water on showers and in beaters was given support. Problems with shiners in book paper were discussed and some of the causes were given as follows: uncooked wood, foam and slime, improper beating, poor quality of rosin, worn out seat in pump, badly worn jordan, lowering beater roll too soon, spots from doctors, settling of pulp in pipes, and pitch in sulphite.

Mr. Macdonald then discussed selection of equipment and stated that the selection was governed by the final cost. He mentioned improvements in beaters and the introduction of the rod mill. He stressed the function of the cost man who was in position to watch changes and improvements, and suggested a need in the industry for cost engineers. The cost engineer, according to Mr. Macdonald, would weld together the purchasing agent, the paper maker and the engineer. He defined the chemical engineer in a generad way as a mechanical engineer with a knowledge of chemistry or a chemist with general knowledge of engineering. The problems of marketing were said to be more important than the technical problems and it was suggested that technical men must find new uses for papers and for themselves. Specialties sell well and their development offers opportunities for the technical man.

Following Mr. Macdonald's paper, a discussion followed in which the slime removal problem received particular attention. The discussion involved the use of chlorine and copper sulphate as well as a patented process for slime removal. It was brought out during the discussion that chlorine worked satisfactorily for a time, but if continued over long periods, it seemed to increase the slime problem. Copper sulphate was given as sure death for foam and the use of bleach liquor instead of chlorine was said to stop the breaking away of rust in pipes.

Immediately following the discussion of Mr. Macdonald's paper, an open forum was held on "Testing of Pulp for Strength."

Cost Meeting of June 22

Two papers were presented before the Cost Section on the afternoon of June 22. The first paper, presented by Mr. H. T. McAnly of Ernst and Ernst, Chicago, Ill., was entitled "Sandard Costs and Budget Control." The second paper of the afternoon was entitled "What Percentage Should be Added for Profit" and was presented by G. K. Ferguson of the Watervliet Paper Co., Watervliet, Mich.

Standard Costs and Budget Control—In Mr. McAnly's paper he told how facts required to develop definite standards were obtained, and stated that the standard cost of any article or of all articles manufactured in a plant, reflects what such articles should cost under normal operating conditions. The controlling principle in standard costs is that of the budget. The budget sets up a definite goal toward which to strive, and provides the means through which all forces may be co-ordinated and directed toward the attainment of a definite objective.

He discussed better shop management and the need for co-operation between production, planning, time study and cost accounting. In building up a normal ideal for measurement of standard costs he said that each of the elements of cost must be considered separately. Material costs, for example, will vary because of variation in the purchase price of the materials themselves, fluctuations in inbound transportation due to rush shipment of material, substitution, and variations of material consumption due to excessive waste. All of these factors of variations were explained in detail and were followed by data pertaining to conversion cost.

In Mr. McAnly's discussion of conversion cost, he explained in some detail the various methods of wage payment including group piece-work, group bonus, straight piece-work, premium, and standard time allowance plans, with particular reference as to how readily they lend themselves to a standard cost system. He also described standard burden rates and stated that the first step necesary in the determination of such rates was the establishment of the expense budget for each department, or production center.

In brief, Mr. McAnly's paper discussed the compilation of standard costs and their comparison with the cost of actual operation as applied to materials and conversion cost or labor and manufacturing overhead.

A number of questions developed from the presentation of Mr. McAnly's paper. These questions were confined largely to the application of standard costs to the paper industry. Stress was laid on problems involved in the application of such a system to the paper field because of small orders, change in schedule, cost of wash ups, etc.

Mr. Cowie on behalf of the Kalamazoo Valley Division of the Cost Association thanked Mr. McAnly for his splendid talk and then introduced G. K. Ferguson of the Watervliet Paper Co., Watervliet, Mich.

What Percentage for Profit—Mr. Ferguson in his paper "What Percentage Should be Added for Profit," briefly outlined the present market conditions in the industry and methods of estimating production costs.

From production cost figures the selling price is determined after considering how much should be added for profit and how. He, basing a definite percentage of profit upon invested capital, gave three ways to apply this figure to the estimates, first—as a percentage of mill costs; second—as so much per ton or per cwt. of paper made; third—as so much per machine hour.

Each of the three methods briefly outlined were expanded and examples given. Comments were made on some of the problems of estimating selling prices and as to the trade custom price differentials. In concluding his remarks, Mr. Ferguson said, "Even granting that the market price is fixed by conditions largely beyond your control, the question then becomes, How valuable is this particular business to the end of profitable operation of your particular equipment?"

A large number of those present took part in the discussion which followed Mr. Ferguson's paper. Many problems about costs in paper mills were analyzed. All cost accountants present certainly obtained points of view which they

will be able to consider in the hope of developing more accurate costs and a fair profit.

First Evening Session

An informal banquet was held during the evening with music and entertainment by Kalamazoo talent. The musical numbers by the Belle Conrad Trio during the banquet hour received much applause. Following the banquet, Mr. A. C. Dreshfield was introduced as the toastmaster for the evening. With witty stories and much humor, he introduced Miss Mildred Tanis, Director of Dramatics, Kalamazoo College and Mr. and Mrs. Henry Overly. The first selection of songs by Mrs. Overly with Mr. Overly at the piano were, "Love's Merchant," "Be the Best of Whatever You Are," and "The Answer." These numbers were all well received and Mrs. Overly sang as an encore "The Cuckoo."

Miss Tanis then presented two monologues, both of which would keep the most serious minded in laughter. The first monologue was "A Dollar Shampoo" and was based upon a hairdresser's conversation with a lady in the chair. How this monologue appealed to the men! The second monologue was Miss Tanis' impression of a Current Events Lecturer before a woman's club gathering in a large city. It was most interesting and gave such information as it seems some such lecturers might use to advantage. Her two monologues were enjoyed by every one and as an encore, she presented "A guide in the Capitol at Washington." It was her impression of a guide taking a group of sightseers through one of the capitol buildings. Interesting—yes, and filled with humor which called for much applause.

Mr. and Mrs. Overly then presented a second series of musical numbers which included, "My Country," "A Dream," "Today" and as an encore, "My Lover is a Fisherman."

Address by Dr. Allen Hoben—Mr. Deshfield following the rendition of this second series of songs, introduced Dr. Allen Hoben, President of Kalamazoo College, as the speaker for the evening. Dr. Hoben's theme developed around the thought of a practical philosophy for our everyday lives. He said that we should take life with a degree of humor and should cultivate a playful mind. He compared work with play and epitomized this comparison by saying, "When you work, you do what you have to, and when you play, you do all you can."

Successful men in invention and research were said to come not in the heavy flat-footed class on the basis of work, but were men interested in adventure and surprises, in studying various combination of elements not yet tried. The spirit of play, according to Dr. Hoben, is what makes for happiness and success. More tolerance is needed in this country. When the spirit of play is injected into our work, things are done easily. The world demands of man some sense of humor.

Dr. Hoben told of some of the problems of research. He emphasized the fact that research may develop negative results. He told of some of his humorous experiences in France as a Y. M. C. A. worker and showed how the playful spirit even under the unusual conditions of war aided in the development of the right type of esprit de corps.

In concluding his remarks, Dr. Hoben left a few questions for his hearers to ponder over. "How much thinking is given to our industrial stack-up" and "Will individual selfishness multiplied by one thousand solve any social problem, or will the conflict of competitive interests in the nation or in the world?"

Mr. Dreshfield thanked Dr. Hoben for his splendid talk in behalf of the Paper Technologists Club of Kalamazoo and the Kalamazoo Valley Division of the Cost Association of the Paper Industry, as well as for all of the visitors present.

After a few announcements, the evening meeting was adjourned.

PROGRAM OF THE SECOND DAY

The morning of June 23 was spent by those in attendance at the meetings in plant visitations or in golf. A large number of the visitors were interested in visiting some of the mills in Kalamazoo or vicinity and took advantage of this "open house" opportunity. Surely, they who visited obtained new ideas and saw many things of interest which enhanced the value of the convention to them.

Secretary T. J. Burke Speaks at Luncheon—T. J. Burke, secretary of the Cost Association of the Paper Industry, spoke at the noon-day luncheon on "Men, Money, Machinery and Materials and their Relation to Costs." Mr. Burke was introduced by Frank L. Brown, Michigan Paper Co., Plainwell, Mich. Before beginning his paper, Mr. Burke read a message of greetings from O. M. Porter, secretary of the American Paper and Pulp Association. In Mr. Burke's paper, the continued co-operation of the Technical Association and the Cost Association was recommended as advisable. The profitless production period in the industry must be looked upon from the viewpoint of the industry as a whole. He stressed the need of a central research bureau, and discussed the problem of labor turnover. He stated that from a study of labor problems in the industry, that thirty out of every hundred voluntarily throw up their jobs each year. It is desirable from the cost standpoint to reduce this labor turnover rate. According to Mr. Burke, the main problem is with the unskilled worker. So far as wage rates are concerned, there is not much variation throughout the industry. Likewise, the rates compare favorably for similar work in other industries. Bonus systems on group plan were said to help. He also recommended an analysis of payrolls which would be essential in the development of a group bonus system.

There should be sufficient money available to provide adequate working capital. Careful financing is necessary. Likewise, getting business by extending credit terms is unfair business, according to Mr. Burke.

Machinery and equipment depreciate and it is necessary to face the facts. Only 14 to 20 years are required to replace all major equipment in a mill because of rapid depreciation.

One of the most important functions of the accountant is to keep a special ledger on machinery which will show the purchase price, date installed, location, rate of depreciation allowed, etc. Such a plant ledger when once started can be easily kept. The Cost Association is now making a servey of depreciation rates being used in the industry in the endeavor to develop standard depreciation rates. Mr. Burke believes that the use of flow meters in the plant will make substantial savings. He mentioned that 35-40 per cent of the conversion cost was in the item of steam and power.

When discussing "Materials and Supplies," Mr. Burke mentioned that storage facilities in the average plant were often inadequate. He recommended a storehouse in charge of a storekeeper and an account of stores kept as accurately as if it were cash. Proper accounting of stores, states Mr. Burke, may make the difference between black and red.

When the working tools—men, money, machinery and materials were discussed in their relation to costs, the thought that co-operative spirit was stimulated all along the line by a group bonus system was developed. A budget system showing money available for various purposes, such as purchase of new equipment, plant improvements was considered as advisable. Since the age is largely a mechanical one, it is easier to regulate machines than men. Each job and each machine should be standardized. It was brought out that many mills have set up standards in the use of tools. Closer co-operation between the technical men and cost men as a means of arriving at true costs.

Mr. Burke was thanked by Mr. Brown for the presentation of his splendid paper, and shortly after his comments, the sectional meetings of the afternoon began.

Technical Section Meeting

E. F. Whittington as chairman of the Technical Section introduced Dr. Th. Bentzen, chief chemist of Whiting-Plover Paper Co., Stevens Point, Wis., as the first speaker of the afternoon session.

Use and Detection of Formaldehyde—Dr. Bentzen delivered a paper on "The Use and Detection of Formaldehyde in Paper." He described the tests which he employs to detect the presence of formaldehyde. The preliminary test given

by Dr. Bentzen is as follows: 50 cc. of about 27 per cent chemically pure sodium hydroxide solution (Merck's regent) is measured into an Erlenmyer flask of about 125 cc. capacity. A little resorcinal is added and dissolved. About one gram of the paper to be tested is zigzag folded and cut into narrow strips, whereupon it is brought into the bottle shaking until all is thoroughly mixed. The flask is then placed upon a heating plate and its contents brought to boiling.

It may be assumed if no red color has appeared after about an hour's thorough boiling, that the paper does not contain formaldehyde. If, on the contrary, the solution turns red during the boiling operation, there is the possibility of the presence of formaldehyde. The reaction of sodiums hydroxide resorcinal to formaldehyde is cherry red, but other substances might cause a similar reaction. Chloroform will cause a similar reaction, but the red color will disappear during the boiling. Sugars show orange yellow to orange red. The presence of albumen will also interfere with the reactin. In case the possibility of formaldehyde is demonstrated, it is necessary to use additional tests. For more systematic tests, according to Dr. Bentzen, a small still is required.

Dr. Bentzen recommends the use of an electric flask heater, a Kjeldahl Pyrex ask with a capacity of 300 cc. and a Friedrick's screw type condenser.

The still is furnished with 50-100 cc. distilled water and one gram of the paper in question. The paper prior to furnishing to the flask should be finely divided to a light downy mass.

An almond grater has been found very useful in reducing the paper to satisfactory condition. The distillation operation should not proceed too far before samples of distillate are collected for testing by any one of several methods.

1—A few drops to a cc. of Nessler's reagent added to the distillate is reduced if formaldehyde is present.

2—A little resorcinal dissolved in about 3 cc. of the previously mentioned sodium hydroxide to which about 3 cc. of the distillate is then added will upon boiling for about one-hour or long turn a cherry red color if formaldehyde is present. This color deepens through continued boiling.

3—When about 3 cc. of the distillate is added to an ammoniacel silver solution—prepared by carefully adding ammonia hydroxide drop by drop to about 3 cc. of 10 per cent silver nitrate solution until the original precipitate just dissolves, a separation of metallic silver takes places upon heating the mixture if formaldehyde is present. The silver will adhere to the wall of a test tube forming a silver mirror.

4—A trace of formaldehyde will cause turbidity in freshly prepared aniline water. Five cc. of aniline shaken with 100 cc. of distilled water should be permitted to stand for five minutes and filtered through moist filter paper for use in this test. The aniline must be fresh and must be kept in small well stoppered bottles with very little air space and should be protected from light.

In concluding his remarks, Dr. Bentzen stated that it was of great importance to be certain that all apparatus was carefully cleaned prior to a formaldehyde test. Otherwise, false results are apt to be obtained.

His paper brought forth many questions and considerable discussion. He stated that he would be pleased to supply any additional information about these tests upon request.

Following the discussion on Dr. Bentzen's paper, Mr. Whittington introduced M. A. Krimmel, Hammermill Paper Company, Erie, Pa.

Krimmel Speaks on Mill Control—In Mr. Krimmel's paper, "A Mill Control System," he emphasized at the beginning that a mill control system should meet the requirements of the individual mill. He displayed a chart which showed the system as employed in the plant of the Hammermill Paper Company at Erie, Pa. The chart revealed the important and close relations between raw materials, auxiliary processes, main processes and the finished product. Likewise, it showed that such an industrial establishment was composed of a group of plants, each complete and an industry in itself.

Control is applied to every raw material, auxiliary process, main process, and on the finished products. Such control permits greater flexibility in plant operation, and better and more uniform quality as well as more economical use of materials. For example, gas strength, temperature of water and gas, and water flow are factors which must be controlled to make a uniform tower acid. Control of the acid making process makes it possible to vary strength of acid with varying wood conditions.

The frequency of tests and reports were also discussed. Mention was made to the effect that every shipment of raw material is sampled and tested. Likewise, many tests are made to control chip preparation, acid making, cooking, bleaching, beating, etc. Samples of paper are taken hourly from each machine and are subjected to such tests that will show whether the product meets certain specified requirements.

The results of all tests are reported immediately to the operator of the process of the tests involved, to the superintendent, and to the general superintendent with follow-up through weekly, monthly, and yearly summaries. Results in practically all cases are reported numerically since numerical expressions are associated with accurate measurements rather than with personal estimation as are quality expressions.

Recording instruments for temperature, pressure, vacuum, Percentage CO_2 and SO_2, liquid level, speed, steam and water flow, conductivity, time and measurements of electrical units are established throughout the plant to give continuous record of vital process data. Such instruments also guide the operator and assist him in maintaining uniformity and quality.

Strength tests of pulp and paper vary with changes in relative humidity. Therefore, in the control system a constant relative humidity of 65 per cent at 70° F. is provided for such tests throughout the year.

All the testing including maintenance and calibration of the recording instruments, is done by the laboratories.

Mr. Krimmel emphasized some of the problems in extending such a control system. He spoke particularly about the need of more control of the quality of wood. Such qualities as affect digester capacity, yield, and cost of pulp are difficult to measure. Fiber loss, sizing, control of moisture in the sheet leaving the presses and in the paper leaving the dryers were factors that also received attention.

In concluding his remarks, Mr. Krimmel stated in part that new tests should be based as much as possible on scientific data. Control methods and systems can probably never be standardized, but a system must be provided to meet the requirements at each mill. Such a system results in the obtaining of good raw materials and in the proper utilization and conservation. Thus it reduces and eliminates waste, insures uniformity and quality in finished products, and shows where more control is needed. It furnishes a foundation for research in that it shows where practical research should be applied and what fundamental research should be conducted.

Numerous questions developed from the presentation of the paper. These questions covered a wide variety of technical subjects, such as water treatment, use of colorimeter and fadeometer, and the position of the laboratory in respect to the other departments of the mill.

Possibilities of the Jordan—The last paper of the afternoon technical section was that of Mr. G. S. Brazeau, Appleton Machine Co., Appleton, Wis., who spoke on "Possibilities of the Jordan."

The function of the jordan was described and actual accomplishments of jordans in several mills recorded. Interesting data was presented of a series of tests which showed that freeness of stock passed only through two jordans compared favorably with the stock which was beaten for two hours and then passed through two jordans.

Likewise, the fold of the stock which had only passed through the jordans was much higher than the stock which had been beaten and then passed through the jordans. Jordan tackle was also discussed with particular reference to the present tendency toward wide tackle and its effect upon the fibers. The effect of speed upon horsepower was mentioned and test figures given. In one instance, by de-

creasing the speed of the jordan 90 r.p.m., the strength factor was increased 31 points, and the power consumption reduced 25 per cent. It was suggested that a head be carried on the intake of the jordan sufficient to force the stock through the machine and to set up a hydrostatic pressure within the jordan. Mr. Brazeau described the advantages of ball bearing or anti-friction bearing jordans and estimated the power saving of the ball bearing jordan at 15 per cent. He mentioned the size and arrangement of jordans as a factor to be considered, and cited a few of the variables affecting jordan operation, such as variation in stock, quantity going through jordan, consistency, jordan tackle, speed, pressure in the jordan, power consumed, temperature uses, etc.

Cost Section Meeting

Several papers were presented before the sectional meeting of the Cost Association on the afternoon of June 23. Mr. Harry Bradford of the Rex Paper Co., Kalamazoo, Mich., was chairman of the meeting. H. S. Davy also of the Rex Paper Company brought to the attention of those in attendance, some information on Time Study, while A. W. Lewis of the Michigan Carton Co., Battle Creek, Michigan, discussed "Cost Data for Executives." The topics, themselves, suggest how important such information is to the management of a pulp and paper enterprise.

Wood of K. V. P. Discusses Bonus Systems—One other paper, "Bonus Systems" was delivered before the convention during the afternoon. It was presented by J. C. Wood of the Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich. In Mr. Wood's paper were stressed general principles of compensation, job analyses and types of compensation, with brief description of each of the various methods of wage payment together with the results and adaptability of the plan to the paper industry. In discussing the group bonus system, for example, Mr. Wood outlined the plan as follows:

The employer agrees to pay a base rate of approximately 20 per cent below the standard rate of wages. He then establishes definite standards of performance for a group, and allows this standard number of hours for the performance of the work. The actual number of hours required to complete the work is then compared with the standard on a percentage basis. At 100 per cent performance, a bonus of 20 per cent is paid to the men; and for each per cent of performance an additional per cent is paid to the employees on their base rate.

Results:

1—Unit cost reduced with increased performance
2—This takes into account indirect labor
3—Does not reward individual effort
4—Requires small amount of clerical work
5—The accuracy of accounts is improved
6—Develops a co-operative spirit among the men
7—Quality of workmanship must be inspected.
8—The plan is very flexible for changing rates.

Adaptability:

This plan is suitable for a large variety of group work, and can be made flexible to meet most any condition.

In a paper mill it is suitable for different types of finishing room operations, loading crews, unloading crews, sorting, calendering, or any of this general type of work.

This plan requires freedom as far as the amount of work that a group can do, and the group production should not be limited by outside conditions.

The last plan discussed was the Hammermill Plan in which a percentage of the gross profits is set aside for distribution. This amount of money is distributed according to groups and classes, depending upon the responsibility of the men in each group. The men in each group receive the same amount of bonus regardless of their base rate.

Results:

1—This plan places the responsibility for economic operation on the men involved
2—Develops the interest of the workman
3—Insures a good quality of product
4—Develops a spirit of co-operation among the men
5—Takes account of the economy of operation
6—Provides an incentive for increased production.

Hayward of Kalamazoo Vegetable Parchment Speaks

Immediately following the dinner on the second day's program, Mr. Lundbeck introduced C. B. Barton, Jr., Michigan Paper Co., Plainwell, Mich., as the toastmaster of the evening. Mr. Barton called upon Mr. Dreshfield to read a bit of poetry on "Our Paper Mill." Some of the high spots in the operation of a paper mill were emphasized in a humorous vein throughout the poem and Mr. Dreshfield made it unusually interesting. Following the reading of the poem, Mr. Barton in his witty way introduced R. A. Hayward of the Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich., as the speaker of the evening.

Mr. Hayward confined his talk largely to some of the problems confronting the paper industry, but with special reference to opportunities in cost and technical work.

He mentioned the general tightening up of business and felt that this condition had actually brought more resourcefulness into business. The problem of over-production was discussed and emphasis was placed upon the fact that men by machinery were able to produce much more than only a few years ago. Production has increased more rapidly than the develepment of markets and it has been necessary for the excess labor caused by such conditions to be absorbed in new industries—for example, the radio industrfy. Such a status in business affairs challenges the brains of technical men to create new products to be consumed by the public, and to continue their efforts in the reduction of manufacturing costs. With lower manufacturing costs, it would be possible to sell for less money and thus the market would probably purchase more than at present. The development of a market in foreign lands was offered as another means of relieving the over-production period in the industry of this country.

The intercompetition of different commodities in the markets of the country has been a rather recent development. It is lumber versus wall-board, wood lath versus metal lath, and structural timber versus structural steel. Likewise, there is competition of such products as radios and mechanical refrigerators, products to make the home more comfortable and attractive. Advertising and salesmanship have done much to increase the sales and open the markets for such products.

The relation of the moving picture industry to the book publishing business also received attention and it was said that book sales have decreased with the increase in attendance at moving picture theatres.

The next four or five years should see, according to Mr. Hayward, a development of advertising to acquaint the public with the value of paper and to give them information about paper. The paper industry must educate the public generally and consistent efforts should be made along that line.

Co-operation and Constructive Thinking Essential to Progress—Several years ago the members of the Technical Association and Cost Association in Kalamazoo decided to hold joint sessions. This plan has worked out advantageously. The technical man, said Mr. Hayward, must be assisted by the cost man, and the cost man must know that his conclusions are true from the technical standpoint.

Continuing his remarks about the technical man, Mr. Hayward stated that the success of any company or organization is proportional to the brains that are thinking constructively in that organization, and that the progress made by such an organization is dependent upon the sum total of all constructive thinking. The technical man should take an active interest in the working force and should develop the thoughts of the workman along the lines of constructive thinking. An organization made up of constructive thinkers will thrive.

No industry, stated Mr. Hayward, has excuse for not making time studies. Time study data when analyzed will show any hold-ups or delays along the lines of the production processes. Likewise, time study data gives information that will aid in the development of some compensation plan which will result in better co-operation of the men.

Conservation of Materials—Mr. Hayward then mentioned

briefly the importance of conservation of materials, knowledge of average superintendent about power costs, and the possible substitution of cheaper materials in the manufacture of equivalent products. Definite information should be available as to quality of pulp and this should be obtained from scientific analysis.

Report writing was the next subjcet stressed by Mr. Hayward. He stated that reports should be written in understandable language and written so that they can be visualized. Such reports will aid the executives in planning. For example, it might be possible to show clearly and accurately how 10 to 20 per cent of power used in the average mill might be saved, or how it would pay to put on the shelf equipment only five to seven years old.

In Mr. Hayward's concluding remarks, he considered the subject of Waste. According to Mr. Hoover's report, "Waste in Industry," he said that the average efficiency of mills in the country was about 40 per cent. Carelessness often costs the paying of annual dividends. This carelessness does not necessarily mean simply carelessness in which personal injuries play a part, but carelessness in use of materials, etc. To be efficient, the men should come to work properly rested and people should be encouraged to live more temperately. "It makes for happiness," said Mr. Hayward. Mr. Hayward's talk interested every one present. Mr. Barton immediately concluding Mr. Hayward's talk thanked him on behalf of the Technical and Cost groups for his splendid talk.

Mr. Lundbeck then made a few farewell remarks, expressed thanks to the mills who permitted their representatives to be present, and to the representatives for being present to participate in the exchange of valuable ideas.

Every one who attended the convention must have felt well repaid for the information and the inspiration received from contact with fellow-workers, and the enthusiasm which comes from doing things.

Wood Chips from Rosin Industry

Extracted wood chips which are the by-product of the rosin industry in the South will give medium-grade pulps suitable for the production of composition boards and the cheaper grades of kraft or wrapping papers, but are unfit for the production of strong first-quality papers. This is the conclusion reached by the Forest Products Laboratory of the Forest Service, United States Department of Agriculture, as the result of a series of experiments on these chips.

The experiments which were made at the request of a concern interested in the disposal of a large excess of waste chips from extraction operations, demonstrated also that the pulp yields from the extracted chips were somewhat lower than the yields from untreated chips .

Among the particular conclusions developed by the laboratory's experiments are: That the rosin extraction process destroys certain wood components which appear to influence pulp quality; that the strength qualities of the extracted-wood pulps are inferior to pulps from unextracted wood; and that the quality and yield of the extracted-wood pulps can be improved by pulping mixtures of green and extracted wood.

"The experiment shows," the laboratory report states, that the pulp from chips extracted by the methods now employed is limited in its use to the lower grades of wrapping paper or to mixed pulp boards of the container type. It is possible, also, that this pulp may be adaptable for use in certain types of paper or composition board specialties, or in numerous paper products in which the use of high quality kraft pulp is not necessary, but a pulp of medium strength is required."

In recognition of his eminent service in forestry, Syracuse University at its fifty-seventh commencement conferred on Samuel Trask Dana, Dean of the chool of Forestry and Conservation, University of Michigan, the degree of Doctor of Science. Dean Dana received his B. A. from Bowdoin and in 1907 Yale University conferred upon him the degree of Master of Forestry.

Power Costs[1]

By F. C. STAMM

Bryant Paper Co., Kalamazoo, Mich.

I was very much impressed with the talk given by Mr. Geo. K. Gibson before the Superintendents at Pittsfield, wherein he brought out that during 1927 there were produced 12,500,000 tons of paper of which only 10,000,000 tons were sold. This means an overproduction of 2,500,000 tons or 25 per cent. These figures are very interesting and of vital importance to all of us and they mean that unless conditions change radically during the next 12 months, mills who haven't their conversion costs reduced to the minimum are going to find it pretty hard to keep up and sell at a profit and we all know that selling below cost not only hurts the mill that is doing it, but tends to demoralize the whole paper market.

With competition as strong as it is at present, and the possibility of overproduction in most lines standing out as it does today, we are reaching a point where it is absolutely necessary for a mill, no matter how large or how small, to have accurate figures on what it is costing them to make their product. These costs are necessary of course in order to determine at what price you can afford to take an order and still make a profit, but more important than that, they are necessary in order to show which items of the total conversion cost are exorbitant and the places where careless and preventable waste is going on.

So many mills are still living in the period of 1915-1920. They still believe that costs are unnecessary except for a rough check on the inventory once a month. Ten years ago, accurate costs were not so important. Competition was not as strong, labor was cheaper, coal was cheaper and the power plants were not objects of very much consideration. But conditions today are a lot different. Power plants are getting very much more attention than they did. The chief engineer no longer feels that his responsibilities have ceased when the steam and power is delivered to the mills. He now follows out into the mills and sees to it that these two items are carefully and economically used. It is the final power cost per ton of finished paper in which we are most interested and not alone the unit cost of steam and power as generated at the power plant.

I believe that few of us realize the importance of power in the manufacture of paper. The steel mills are generally recognized to be the largest consumers of power in all the industries. However, a recent survey shows that for every $1,000,000 invested in the steel mills there is used 1562 h.p., while in the pulp and paper industry for every $1,000,000 invested there is used 2143 h.p. Thus you can see that the paper industry leads all the industries in the consumption of power per unit of capital invested, and for that reason we should also be leading them in the standardization of power costs, but I don't believe we do. Our cost association and the N. P. S. B. have done much in the last ten years to organize and standardize the costs, and the newsprint mills are in exceptionally good shape but the other lines of paper have still a lot of pioneering work to do.

Being an engineer, I am naturally most interested in the steam and power costs and their relation to the other conversion costs, and from my experience I would say that power is not only the largest and most important single item, but in addition is the item in which there is the greatest chance for careless and preventable losses. These facts are clearly shown from an analysis of the N. P. S. B. reports. A careful study of these costs will reveal: first, steam and power in the average mill will amount to 35 per cent to 40 per cent of the total conversion cost—labor will come to only 20 per cent; second, the difference between the various mills on any of the other items will not amount to much over $2.00 a ton while the difference between the mills on the item of power will come to $6.00 to $7.00 a ton. In other words, the chance for loss and waste is larger in the power item than in any of the others and in most mills it is the item in which the biggest saving can be made with the least amount of money and effort.

[1] Paper presented before Technical Section of the Interstate Technical and Cost Meeting, Kalamazoo, Mich., June 23, 1928.

Controllable Items in Power Costs

There are a number of items, which when taken collectively would lead one to believe that the matter of reducing power costs was an intricate and baffling problem. As a matter of fact, when these items are studied individually and with the aid of some good cost figures, the problem of reducing power costs becomes more of a matter of management than of engineering. Take first the problem of combustion.

Combustion—Flow meters in a boiler room are very useful. They show the total load on the plant, whether it is increasing or decreasing and enables the firemen to intelligently and correctly distribute same. Scales for weighing the coal from the bunkers into the hoppers are also convenient for accurately checking the inventory at the end of the month. Both of these items are necessary in order to get a correct cost distribution and the extent to which they are installed should depend entirely on the size of the plant. However, no power boiler, no matter how small, should be operated without a combustion indicator of some sort such as a CO_2 recorder or a Bailey meter.

Combustion is a chemical process. Oxygen unites with carbon to form heat. A correct amount of oxygen will assure a complete reaction and the liberation of the maximum amount of heat, while too much or too little oxygen will considerably reduce the amount of heat available. No chemist here would think of operating a chemical process without some indicator to show how the reaction was progressing. Combustion with the aid of an indicator becomes a very simple problem. Without an indicator it becomes one of the major items where you will find careless wastes and losses. CO_2 recorders are comparatively inexpensive and will show from 100 per cent to 500 per cent on the investment.

Steam Piping—The next problem, and one which most of the older mills have to contend with is the careless way in which steam piping has been installed and extended. Most mills have thousands of feet of steam piping forming a network over the whole mill many lines of which parallel and duplicate each other. One main down the center of the mill with branches running directly to the places where the steam is used will not only simplify the layout but will cut out thousands of feet of small unnecessary piping. A chart prepared by the Mellon Institute shows that for every 100 feet of 1 in. piping carrying steam of 160 lb. pressure, there is wasted in radiation about 20 tons of coal in a year. A walk through the average mill will reveal many one hundred foot stretches of pipe which could just as well be eliminated.

In line with this same subject is the matter of pipe covering. Mr. McMillan while at the University of Wisconsin prepared a very complete tabulation showing that pipe covering will return from 700 per cent to 1100 per cent on the investment. Many of us work hard to have the management O. K. an appropriation for $10,000 or $20,000 which will show a return of about 50 per cent on the money invested but entirely overlook this innocent looking little item which will show a return of around 900 per cent. For every dollar you spend for pipe covering, you have nine dollars worth of coal in a year.

Drying and Ventilating.—The items of drying and ventilating play a very important part in the final cost of power. However, each of these items could take up hours of discussion in themselves so I don't want to get into them very deeply. Five or six years ago everyone was interested in drying. The Technical Association Committees on Drying made long reports and elaborate drying codes and there was quite a lot of valuable work done on the subject. Today, however, you seem to hear very little about drying and the reason for this I believe, is because most of the engineers after much work and discussion on thermal efficiency and heat balance concluded that a dryer being a heating unit was as near 10 per cent efficient as was possible to make them. Steam cannot be condensed in a dryer without giving up heat, and heat cannot be given up unless work is done such as evaporating water or heating air and this hot air is necessary for ventilation. So thermally, a dryer is really 100 per cent efficient, all of the heat given off going to do some useful form of work. It is true that the rate of heat transfer through the dryer shell may vary slightly under operating conditions, the factors effecting this transfer being chiefly air inside of the dryers or dirt on the outside of the dryers. From all of the data I have been able to collect, **water in a dryer does not materially affect its rate of heat transfer.** I know this statement will give rise to a lot of comments but a careful study of dryers in operation has convinced me that a dryer filled with water, as long as you keep the air out of it, is just as efficient as an empty one. Please do not misconstrue that I am advocating to keep your dryers full of water. Water in dryers puts added weight on the journals and also makes the dryers sluggish to a quick change in temperature, but I don't think that it effects their thermal efficiency at all.

Now these are some of the larger items which if not watched closely will soon boost the power costs, but many times we will spend a lot of effort trying to find some big items wherein we can reduce the power costs and overlook a multitude of smaller ones which when added together will amount to an astonishing loss. It is generally true also, that these smaller items are more easily corrected and with a proportionately smaller outlay of capital than are the larger items. Let me cite just one instance.

Lubrication—The cost of lubrication in comparison with the total cost of paper is so small that it seems not worth the time to bother with it. However, I have seen the cost of lubrication reduced from $17,000 to around $8,000 a year, a saving of nine thousand dollars which was practically a clear profit. The only expenditure necessary in order to effect this saving was a little spare time on the part of one man to organize the use of oils in the mills and to specify the correct oils to purchase and the place where each of these oils should be used. There is nothing that will pay quite so large a dividend as the systematic study of some of these unimportant looking little items.

The Necessity of Power Costs and Their Uses

An old practical engineer once asked me, "Just what good are power costs anyway," and after I had gotten his point of view, I could plaintly see why so many of the older men scoff at power costs. Their attitude is simply this,—any engineer who knows his job can tell whether or not his power costs are high and if they are high he doesn't need a cost system to tell him where to cut them. This statement was absolutely correct when the plants were small and the chief could be down in the plant spending most of his time with the job;—but today with plants as large as they are and with engineer's duties extending into production as well as power, he cannot spare the time to stroll around the boiler and engine rooms, he must have a set of cost figures to tell him the story in a condensed form. Furthermore, even the old engineer could have used the costs to advantage if he had only thought of it.

Take, for instance, the man who spends a whole afternoon in the hot sun chasing a small white ball around the golf course. When he first started he probably shot 100. As he improved his game he gradually reduced this figure until he could make it in 80. Par on the course is 74 and if he could only make that 74 once, Boy, the world would hear about it. This very same competitive spirit can be instilled into the most humble and ignorant fireman and I have personally seen men who couldn't read or write wait expectantly for the monthly efficiency and steam costs to come out to see if they had bettered their previous month's record. This inborn pride which every man has for improving his own game can be put to work much more than it is, and I believe that it is one of the biggest factors which will tend to reduce the power costs.

From the management point of view, of course, power costs are necessary. The manager who spends most of his attention on watching production is soon going to find his power department sliding backwards unless he has an exceptionally efficient man in charge of power. Any department which lacks the attention of the management is very apt to fall behind and the power plants in the past have certainly lacked this attention. The only way that the management can give the power department the attention it deserves is by summarizing the operation of that depart-

ment through the power costs. A good cost system will point out the importance of power and not until the management realizes just how large this item really is and that in the average American mill it is possible to reduce the cost of power from 30 per cent to 50 per cent will power get its share of attention. "Ignorance is bliss," they used to say, but ignorance doesn't go far with the traffic cop today and bliss won't help reduce the power costs very far, so let's try and cut them both out of the power plants.

Another use which the management should make of its power costs is a guide to the future installation of power equipment in order to further reduce costs. When looked at from this angle, I believe that it is safe to say there are very few mills today that have true power costs. Take for example the installation of a new machine where it is necessary to decide whether to put in a steam engine drive or to go to the more elaborate and expensive sectional electric drive. There are many arguments in favor of both but unless you have some tangible facts in the form of cost figures it is a rather difficult thing to decide. Any engineer can make up a heat balance comparing the thermal efficiencies of these two units, but there are many other items which go to make the final cost of power beside the steam consumed and these are just the items which at present are lacking in our power costs.

Practically none of the mills set up their cost figures so that they include the labor, repairs, supplies, lubrication, and overhead on the power equipment in the machine room. All of these items are lumped in with their respective paper machine charges, and the only charges that go into power are the distributed costs from the power plants. You can see how easy it is to fool yourself and put in very elaborate equipment when none of the operating charges on this equipment are charged to power but go directly in with the other paper machine charges. New and expensive equipment is sure to reduce the steam and power consumption but against this saving must be charged the overhead and maintenance on this equipment or your power costs won't be true power costs and inaccurate costs can many times do more harm than good.

A discussion of power costs isn't complete unless something is said about that much argued point of charging out exhaust steam. When steam passes through a power unit and out into an exhaust main to be used in process, there is very little of the heat removed and for most work is just as good as steam at 150 lb. pressure. The power which is generated from this steam is therefore very cheap and will cost about one tenth of the cost of power generated by a condensing unit. The question naturally arises, is it fair to give all the benefit of this saving to the power generated or should not part of it be distributed to the processes which are using the exhaust steam. It is the same as the old question, "Which came first, the egg or the hen?" In order to have eggs you must have hens to lay them and in order to have hens you must have eggs from which to hatch them. So it is with these component items which come from an operation of this kind. If either the demand for power or the demand for steam is removed, the other item will have to stand the whole charge and the cost of it will go up considerably.

If the mill is all in one unit, under one superintendent, and all the power goes to this plant, it makes no difference how you charge it out. Which ever way suits your fancy will give you the same results as far as total power cost per ton of paper, and as I said before that is what we are mostly interested in and not the unit cost as generated at the power plants. However, in a large plant where one power plant serves four or five divisions, each division under a separate superintendent and each division making a separate kind and grade of product, care must be used in order to determine the correct charge on each of these items. If the demand for steam and power were in the same proportion for each of these divisions it would work out nicely, but invariably they are not and you will find that the power cost will be shifted as much as five dollars a ton depending on whether you credit the power generated or the exhaust steam. I don't believe that there is any one correct way which will fit all mills for charging out these two items but in a case such as just cited I believe the only fair way would be to split the profit and give each of the items half the benefit of the saving and in this way all divisions will benefit alike. In any cost system, I believe the simplest way that the story can be accurately told is the best way. For a small mill making very few grades of paper you can have a very simple cost system and still show accurately what is being accomplished in each department. In a large diversified mill the system will have to be much more elaborate if true costs are to be shown.

Conclusion

In conclusion, I want to summarize the main points which I have tried to bring out.

1—In order to compete today a mill must get its cost cut to the bone.

2—You cannot intelligently attempt to cut your costs unless you have accurate figures to show the items on which you are wasting.

3—Steam and power in the average mill is larger than labor and is the item in which there is the greatest chance for saving with the least expenditure of time and money.

4—The management should use the power costs to check the operation of the department and also as a guide to the installation of new equipment.

5—The larger and more subdivided the mill, the more careful we must be in the way the cost distribution is made.

Possibilities of the Jordan[1]

By G. S. BRAZEAU

The Appleton Machine Co., Appleton, Wis.

THE advent of the Jordan in paper manufacture was of tremendous advantage because it gave the paper maker a tool with which to control his stock going to the paper machines. All of his stock preparation had been a batch process and even the most skillful beater engineer had constant variations in his stock prepared. Once a beater was dropped, there was no recalling it and the machine tender had to run it as best he could. The Jordan gave the engineer and machine tender a correcting factor. With it they could drop the beater while the fibers were still a little long and through the Jordan could finish it off to the exact freeness at which they wished to handle it. The function of the Jordan in stock preparation has been, until recent years, to merely finish off or temper the stock for the paper machine.

Recently the Jordan has been lifted from its position as a mere corrective agent and glorified by being given a real work to do in stock preparation. This event has been arrived at by the slow process of evolution, so there is no marked point in Jordan history where the Jordan passed from corrective to productive functioning. The introduction of the sulphate process into paper making probably gave the Jordan a greater impetus than any other factor. The paper makers found that they had a long, tough fiber to deal with, which responded slowly and stubbornly to beating. In searching for an efficient and effective means of preparing kraft, the paper makers turned to the Jordan. They found it efficient and economical and have quite generally adopted it as their major hydrating medium. In this regard in three Wisconsin kraft mills, one is developing 94 per cent of its total rise in Mullen test in the Jordan; one 7 per cent and the other 65 per cent. Several of the southern kraft mills are depending entirely upon their Jordans to effect hydration.

Sulphite stock will respond equally well to Jordan action. The writer recently witnessed a series of tests run on the relative hydrating effects of the Jordan and beater, on 100 per cent sulphite pulp going into a sheet for waxing. This stock was normally beaten one hour and run through two small Jordans. In this test, the Jordans were left at constant settings and the beating varied as follows:

	Pop.	Dens.	Free-ness	Fold
Initial strength of Sulphite	59.2	9	14.5	50
2 Hrs. Beating & through 2 Jordans	90.3	170	38.	260
1 Hr. Beating & through 2 Jordans	90.7	160	36.	308

[1] Paper presented before Technical Section of the Interstate Technical and Cost Meeting, Kalamazoo, Mich., June 23, 1928.

No Beating but through 2 Jordans....90.3 120 35. 408

The paper run at the various degrees of beating was kept separate and it was found that the printing and absorption qualities of the sheet which had been Jordaned only, were equal to the sheets made from stock one and two hours. This mill at present is not using beaters on this type of stock.

Mills making rag papers are generally using their Jordans to shorten the rag fibers. They depend largely upon the cutting knives. To accomplish this they use narrow tackle, 3/16 and ¼ inch.

The Jordan is steadily gaining in favor as a stock preparing machine. Only recently have the possibilities on certain fibers been recognized. As more is learned about handling a Jordan, it may become our principal hydrating medium.

Factors Which Make an Efficient Jordan

There are several factors which are integral parts of an efficient jordan, no one of which can be neglected. Probably the first to consider is the tackle in the jordan because the knives actually do the work. The present tendency is towards wide tackle, that is, ⅝ inch and over. The use of wide tackle gives more square inches of grinding area and reduces the number of cutting edges. For example, in a particular jordan of medium size, equipped with quarter-inch knives, there are 80 knives in the plug and 235 knives in the shell—315 knives in all, with a total grinding area of 1640 square inches. In this same Jordan with half-inch filling, there are 68 knives in the plug, and 194 knives in the shell—262 in all, with a total grinding area of 2821 square inches. In the quarter-inch filling there are 315 cutting or shearing edges, with 1640 square inches of grinding area, against 262 cutting edges and 2821 square inches of grinding area in the half-inch filling has 17 per cent less cutting edges and 72 per cent more grinding area than the quarter-inch filling. This greater area of metal in the half-inch filling gives a very desirable brushing action, drawing out the fibers and separating the fibrillae so they may ? properly on the wire, to form a strong sheet of paper.

The speed at which jordans are run is a big factor in efficient operation. At the proper speeds the jordan will produce better stock and consume a minimum of power. In one instance, by decreasing the speed of the jordan 90 r.p.m. the strength factor was increased 31 points and the power consumption reduced 25 per cent. In another instance, slowing the speed 50 r. p. m. reduced the power consumption 15 per cent and did not affect the quality of the stock passing through it. There is an efficient speed at which to run Jordans. This should not be considered in r. p. m. of the plug, but in feet per minute of knife travel. It is best to work with the peripheral speed of the large end of the plug. It is evident that small Jordans should run at a higher r. p. m. than large ones.

It is also necessary that a head be carried on the intake of a Jordan sufficient to force the stock through and also to set up a hydrostatic pressure within the jordan. In order to set up pressure within the jordan, it is necessary to choke the outlet with a plug valve or counter head. The jordan should not be considered as a pump. In some instances, jordans have been speeded up to increase the amount of stock going through them. Doing this, increases power consumption materially when better results could be obtained by increasing the head. One very good way to maintain a head on a jordan is to pump directly, using no head box, the stock goingfi directly from the pump to the jordan, the pressure and amount of stock being regulated by the valve in the return or over-flow line. With this installation a wide range of pressure is available. The stock is kept clean—there being no open head box—it is also inexpensive.

Equipping jordans with ball bearings has given them greater possibilities. The perfect alignment of the plug gives a new accuracy to jordan performance. Ball bearing equipped jordans actually develop more strength in the stock with less consumption of power than those with plain bearings. At the same power consumption and delivering equal amounts of stock, two identical jordans, except for their bearings, gave the following result: The ball bearing equipped Jordan developed 3 per cent more strength in the stock than the plain bearing one. To jordan efficiency, ball bearing equipped machines are very necessary. They produce a superior stock, prolong the life of the tackle and save power. The power saving can conservatively be figured at 15 per cent. One ball bearing jordan paid a dividend its first year of $759.00. The power consumption of this jordan was 17 per cent less per ton than that of an identical jordan in the same mill which was on plain bearings. Jordans give a greater opportunity for power saving than any other piece of equipment in the mill.

The size and arrangement of jordans is a factor to be considered. In some instances several small jordans will function more economically than one large one. The greatest thing to be said in favor of the small jordan is their flexibility. If the installation consists of two small jordans and it becomes necessary to fill or repair one, fifty per cent of the total jordan capacity remains which can be crowded and production maintained. Using only one large jordan, if it becomes necessary to shut down, all of the jordan capacity is lost. This flexibility is a decided point in favor of small jordans. As far as can be determined, the power consumption per ton is as great in the large as in the small jordan.

There are so many variables affecting jordan operation that it is no small task to run tests on it. The variation in the stock itself, the amount going through, its consistency, the tackle in the jordan, the speed, the pressure in the jordan, the power consumed, temperature rises, etc., all must be considered. It will be profitable for all using jordans to spend some time and energy studying them. There is no authority to turn to, so each individual must make his own findings.

Brown Instrument Co. Builds New Addition

The Brown Instrument Company of Philadelphia, makers of industrial and power plant indicating, recording and automatic control instruments for measuring temperature, pressure, fluid, flow, machine speed, per cent CO_2 in furnace flue gases, etc., is building another addition to its plant. The new structure will be 60 ft. long by 44 ft. deep and two stories in height. Heavy foundations will permit other floors to be added as future requirements may demand. Construction will be strictly fireproof throughout. The rapid growth of the company and the enlargement of its line has made necessary this latest plant addition, the third within eight years. Its primary purpose is to provide research facilities commensurate with the needs imposed by the rapid expansion of the company's interests with respect to variety of products and the continually widening application of Brown Instruments to the activities of industry and science.

Naylor Pipe Company

With the announcement of the completion of their new plant and the increase of their facilities some 200 per cent, the company formerly known as the Naylor Spiral Pipe Company also announces the change in name to the Naylor Pipe Company.

The new product of this organization, Spiralweld Toncan Iron Pipe, no longer being comparable to light weight, sheet metal pipe, but putting it rather in the category of standard weight pipe, has necessitated the increased facilities, as well as the change in company name.

There will be no change in management, all officers and executives carrying on in their present positions.

The Hill Clutch Machine & Foundry Co., of Cleveland, O., announces the following appointments in its sales organization: James T. Gordon Co., 11 Park Place, New York City, has been given the Metropolitan New York territory; L. F. Dolan, 27 Hancock St., Dorchester, Mass., will have the State of Massachusetts; T. L. Rose & Sons, 1104 House Bldg., Pittsburgh, will handle the Pittsburgh territory; A. E. Woolam, Box 1089, Kalamazoo, Mich., is representative for Southern Michigan, and McNeal Machinery Co., Joplin, Mo., will handle Kansas, Missouri and Oklahoma.

Improved Shaking Apparatus for Fourdrinier Machines[1]

By C. E. MACKLEM
Beloit Iron Works, Beloit, Wis.

ALTHOUGH this is to tell the story of our Improved Shake or fourdrinier machines, we wish to warn you that we also expect to describe to some extent the removable feature, because to us the fourdrinier is a unit of our machines and to speak of an improved high speed shake means also an improved fourdrinier part throughout.

We also wish to advise at this time, for fear that this paper may sound too much like an advertising scheme, that the new Beloit fourdrinier can be obtained from any of the builders you may wish to deal with. They, of course, may not talk this construction as strongly as we do, as naturally any engineer is always a little more satisfied with his own developments but they are all licensed and can build these in their own shops, at the same time having the benefit of our drawings and experience as much as desired. We felt soon after we started to develop this feature that it should, for the good of the industry, be an open proposition so that all who wanted this fourdrinier could have a reasonable delivery. We soon found our shop could not take care of all of the people desiring this construction, and of course we did not wish to enter the business of building fourdrinier parts only, as we have an organization and factory built up for the complete machines which, therefore, were only suitable for a certain amount of fourdrinier work.

But, getting back to the shake, we all remember that until recently most of us had always felt that fine paper and those requiring a thorough interlacing of fibers could not be successfully made on the wide machines and at higher speeds. This had also been our conclusion and, in fact, is our opinion today insofar as the conventional type of fourdrinier is concerned. We did not feel, however, that the development of the fourdrinier machine with regard to width, speed and production should stop at one point because the old time shaking arrangements were not equal to any greater width or speeds in the machine.

While the mills were either using the old fashioned slow speed shake or no shake at all, and were virtually standing still from the standpoint of quality and speed, our president, Mr. Aldrich, who is undoubtedly today the dean of engineers in the industry, contended we were all wrong and must carry our old basic principles up to where the quality could be produced at high speeds. This, of course, had the thought of increasing the speed and he set himself to the task of working out a shaking part that would carry the quality up to, in many cases double the speed formerly used on the same grades of paper, using the old shake, which was doubling the production. Thus the result of his study was our new Aldrich Shake which, coupled with the Removable Fourdrinier is the subject I wish to present at this time.

Our first great change in the fourdriniers was to build the removable type which was first designed to save three or four hours of production when changing wires. We soon found this fourdrinier gave us added advantages as it enabled us to design and build fourdrinier parts that did not have to be completely taken apart and reassembled every time a wire change was made and therefore opened a new type of fourdrinier construction. Our next great problem of improving the shake was helped, therefore, by this removable fourdrinier, especially on wide machines.

The Need for a Faster Shake

The conventional type of fourdrinier at the time we started this work had a device for shaking a fourdrinier from two hundred to two hundred fifty shakes per minute and these shaking devices were arranged to change the length of stroke by shutting down and changing the position of the eccentric heads. We found that two hundred fifty strokes of the shake worked out very well on the slow speed machines, but when the machine was running five hundred feet per minute, the sheet would receive only one shake in two feet of paper and only one shake in four feet of paper when the machine was running one thousand feet per minute. It was apparent that at these speeds the ordinary type of shake had little or no value and the feeling was that if these higher speeds were desired, the shake might as well be discarded.

The logical thing to do was to speed up the shake giving more shakes per running foot of paper but with the old type fourdriniers this was found to be impossible owing to the great weight of the shaking parts, and in the ordinary machine, even then, the shake was being cushioned so that the whole fourdrinier part would be protected from the shock and jar of this shaking device.

Other methods had also been tried. Fourdriniers had been built, designed to give greater stiffness, but these, instead of helping conditions, merely added more weight, as often times the wire rolls were included with the shake as well as other parts, and the various truss forms and ties added simply required that the whole fourdrinier part be still more carefully cushioned to protect it from the shake.

This cushioning effect upon study was found to destroy the real usefulness as it is this sharp jar or jolt on the reversal of the stroke in each case which settles and interlaces the fibers. This jolt was being obtained on the narrow, small machines nearly the same as it was in olden times obtained by the hand paper maker who, in lifting his mold full of stock from the vat, would shake it several times before the water drained out in order to interlace these fibers; but on the cushioned shake this had been lost almost entirely.

On going into this subject further, we also found that most mills, even on the smaller machines, were not getting the full benefit of this shaking action because the speed of the shake was difficult to adjust and the length of stroke had to be changed while the machine was shut down. All stocks, of course, do not act the same and in fact, the same stock acts differently on the wire at different temperatures and when making different weights of paper. Thus, we found from our studies that the shaking device should be so built that the paper maker could adjust it easily both for speed and for length of stroke while the machine was running and from a position from which he could easily observe the appearance of stock on the wire. Added to this, it was necessary that this shake be so arranged that the fourdrinier could be easily adjusted as to pitch during this same time.

Description of Improved Shake

The above conclusions gave us the information and basis for building our improved type of shaking device. Briefly summarized, this would be about as follows:

1st—As with all paper machinery, this shaking device must be absolutely reliable, capable of giving continuous service with a minimum amount of attention, care and upkeep.

2nd—The shake produced must be efficient and give the desired results on wide and high speed machines which meant that the fourdrinier part of these machines had to be specially designed so as to give as light a shaking part as possible, at the same time maintaining the stiffness and strength necessary. Also, this shake must be applied to the fourdrinier in a simple way and avoid the cushioning effect and yet it must be applied in such a way that it can be used on the Removable Fourdrinier, as we felt sure at that time that all machines both narrow and wide would soon be built in this manner.

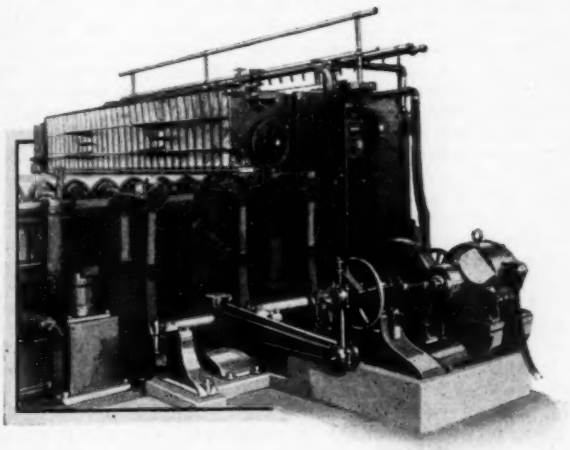
3rd—Was to make a shaking unit in which speed and throw could be easily adjusted while the machine was running and which would allow the fourdrinier part to be lowered or raised at the same time.

The first improved shaking device was built for a new machine which we furnished for use on kraft papers. This machine was shipped during 1923. It soon showed its superiority in action, the vice president and general superintendent writing us at the time that it was an easy matter for them to obtain any kind of formation desired. "For instance," he said, "we are able to close up our long fibered kraft stock into a sheet with the formation of book paper. We can increase our pop test to 110 per cent and often to 120 per cent with the proper adjustment of our shake."

The shake pedestal itself which we use is low down, very

[1]Read at the annual meeting of the American Pulp and Paper Mill Superintendents Association, Pittsfield, Mass., May 31, 1918.

compact and solid, the driving shaft being 4" diameter and is geared direct to a direct current variable speed motor. The control for this motor being placed either on the front side of the fourdrinier part on the shake pedestal itself, wherever desired by the operator. There is a hardened steel shaft extending through this main driving shaft which regulates the length of stroke or throw of the shake. This is provided with Timken thrust bearings and this throw is regulated by a hand wheel connected to this internal shaft.



Showing the complete Aldrich high speed shake mechanism on a high-speed kraft machine.

On small machines this shake pedestal can be connected to the fourdrinier part by means of a ball crank but on the wider and removable fourdriniers, the pedestal is connected to a very large diameter shaft 6" to 10", located by the sole plate from which extend several arms connecting to the back fourdrinier rail in several places.

The fact that the shake is connected to the breast roll and table by means of several shake arms allows you to shake a part of the table rolls only, if desired, by disconnecting one or two shake arms, or, if the operator does not wish to shake the table rolls at all, but does wish to shake the breast roll, this can be arranged easily.

The breast roll posts are dispensed with as they are heavy and not adapted for doing the work under high speed. The breast roll is mounted in Timken bearings and one of the shake arms is connected direct to the housings. The roll is supported on long flexible leaves from a heavy stationary post that does not have to be shaken.

The table rolls also should be mounted in Timken bearings as these make for better wire life, require less attention than plain bearings and eliminate the wear and end play which is found with the plain bearing type. I believe we have all seen at some time old fourdrinier parts, the frames of which were shaking but the table rolls and wire were practically still, the shake being taken up in the bearings of the rolls. The table rolls with this improved shake are mounted on light stiff rails which are supported by long flexible leaves from the heavy stiff under framing of the machine, which is not shaken. Thus these table rails need only be strong enough to hold the rolls and prevent whipping, and by connecting the shake in several places intsead of just at the breast rolls, as used to be done, this weight can be reduced greatly. The slices, deckle rails, cross shafts, wash troughs and other equipment that is often times supported on these rails for best conditions should be supported from the non-shaking part of the fourdrinier.

In addition to lightening the fourdrinier part by elimination, we have also found it possible to lighten this greatly by the use of other materials for the rolls and any braces necessary. For example, the table rolls instead of being made of brass tubes are made of aluminum tubes which weigh less than a third of the brass. The heads are also made of aluminum and also such parts of the rails and bearings as possible. These aluminum rolls give very good results, although in many cases, owing to the nature of the stock and of the water to which the mill has access, it is advisable to have them covered with rubber or brass. The same saving in weight is also made in the breast rolls which are made up of lightest possible construction consistent with stiffness. Also the connecting parts of a shake to the breast roll are made of aluminum alloys. The breast rolls are sometimes covered with rubber or in some cases stainless steel or other materials which are best adapted to the conditions in certain mills. We use stainless steel a great deal on this fourdrinier part since because of its great stiffness and strength as compared with brass it makes a better construction and a great saving in weight, and although the stainless steels are much more expensive than the brass, the fact that the weight is less makes the comparison in cost very favorable.

This saving in weight may not seem to be of utmost importance to some of you but when you stop to realize that on a 160" machine we have been able to reduce the weight of a shaking part five tons, we believe you will recognize how much more this high speed shake can accomplish than with an old convential fourdrinier. This great saving in weight accomplished both by substitution of lighter materials and improved designs enables us to build 200" and 247" width machines for book kraft and bond paper, giving them a quick, sharp, lively shake of four hundred strokes a minute, thus making them capable of higher speeds at the same time making a better sheet than the old time narrow machines.

There is another great advantage which is accomplished by means of lightening up the various rolls on the fourdrinier parts in addition to the fact that it makes the shake more efficient, and that is, it reduces the load to be pulled by the wire and which we have found makes a substantial saving in wire life.

The Removable Fourdrinier

The wire life has also been helped by a number of features of the Removable Fourdrinier in addition to the light rolls. You are all, no doubt, familiar with the Removable Fourdrinier so we will not go into a description of it at this time. The whole idea is that all the parts such as table rolls, breast roll, wire rolls, shower pipes, savealls, suction boxes are all combined in a unit and are rolled to the front of the machine by means of a small motor geared into the wheels instead of all parts being removed, then replaced, one by one. When the fourdrinier is removed, the wire is placed on a wire carriage which is furnished and then run over the couch roll. This couch, if of che Beloit suction type, is a cantilever roll which can be supported from the back journal when changing wires. After the wire carriage is run in position placing the wire around the couch, the carriage is wheeled toward the breast roll unrolling the wire, the crew supporting it by putting in place the wire poles furnished. This leaves an open loop into which the fourdrinier unit is rolled again and locked in position.

This arrangement saves time in wire changing as a wire on the largest machine can be changed just as easily and quickly as on a small one. This was to be the big advantage of this construction when first designed, but one of the first improvements was the wire carriage as described and the cantilever suction couch roll that practically eliminated the handling of the wire. This immediately makes a saving of wires as the bad edges, cracks and creases caused by handling heavy wires in cramped quarters by a great many men are eliminated.

The next thing that helps wire life is that the rolls are not scraped, burred or dented, also they stay in the exact position and alignment as when the machine was first installed, thus eliminating the changing of rolls, putting them in frong bearings that cramp and run hard, and the changing of their position to make the wire glide properly after starting the wire. This same applies to the suction boxes that are not moved with relation to the rest of the machine except when removed to have their covers dressed. These points all help and lead to better wire life.

The suction box oscillator which is used to keep the boxes moving under the wire at all times is also a great help in

wire life. This keeps the suction box covers smooth, cuts down the wear, prevents paths or grooves being worn by the wire, eliminates to a large extent planing covers by distributing wear over a large surface, and helps guide the wire saving the edges greatly.

The results achieved by the improved type shake have been much greater than anything we ever expected to accomplish and we are pleasantly reminded of that fact often times, as when recently we wrote a mill with our improved type fourdrinier asking them the tearing strength of their paper under certain conditions, we received a letter in reply which, after giving us the information for which we asked, advised that the writer found it necessary to go to the mill and make these tests because their tester had fallan into disuse, since with the new type shake it was so easy to accomplish the desired results. He advised that he had not received a kick from his bag factory for a year, which he felt was very close to perfection. It is, of course, very gratifying to receive such high endorsements and also to check over the list of repeat sales which are the true measure of a machine's usefulness. We believe you will be interested to know that there have been built and are on order about seventy removable fourdriniers, all of which, excepting those used for newsprint entirely, are equipped with this high speed shake. Also, of these seventy machines, twenty-seven were built from our design and under our patents by other builders. In addition to this there have been five or six new machines with non-removable fourdriniers with this high speed shake. In addition to the new machines, we have about twenty of these high speed shakes applied to old machines and in all cases where one has been installed the mill has found it of great advantage and has laid its plans for installing this equipment in all the machines in the mill.

We are a little afraid that our leaping from one point to another in the above article has been a little confusing and now wish to sum up the whole paper very briefly. A few years ago the shake was about to be discarded on many papers; now it is again highly regarded on all except newsprint and there has been talk of again using it in this place to help make the better formation and finish demanded these days, and who knows but in a few years we will again see a shake on news machines. This increased importance of formation and finish to the paper buyer in these days of high standards has brought the shake back to its position of importance and this High Speed Aldrich Shake enables us to build, and the mill to operate machines at twice the speeds and twice the widths, at the same time getting a better sheet than ever before.

In closing, I wish to express our appreciation of the help and co-operation given us by the superintendents of the various mills. They always help us with these improvements, and by giving us freely the benefit of their observation and experience, we are able to put these improvements into their hands in a much higher state of perfection than otherwise would be possible, and when they take hold of them in the mills they stick to them until they are entirely worked out and are performing the work for which they were installed. Thus, our work to be successful, is a joint work and if we succeed it must be by the help of the Paper Mill Superintendents.

Leopold Leaves Forest Products Laboratory

Aldo Leopold, associate director of the U. S. Forest Products Laboratory, resigned July 1 to engage in private work as consulting forester specializing in game management.

Mr. Leopold's departure ends 19 years of work in various branches of the U. S. Forest Service. In 1908, following his graduation from the Yale Forestry School, he entered the government service as forest assistant on the Apache National Forest in Arizona. In 1912-13 Mr. Leopold was forest supervisor in charge of the Carson National Forest in New Mexico. From 1919 to 1923 he was assistant district forester in charge of fire control and field personnel in U. S. Forest Service District 3, which embraces Arizona and New Mexico. Mr. Leopold was transferred from this position to the associate directorship of the Forest Products Laboratory in 1924.

Reduced Rates on Air Mail Effective August 1

It will cost only one-quarter as much to send the average business or social letter by mail on and after August first as it does now, for on that date the rate will be reduced from ten cents a half ounce to five cents for the first ounce or fraction and ten cents for each succeeding ounce or fraction. This means that an ordinary letter may be sent anywhere in this country for five cents and that an air mail package which now requires $2.00 postage may then be sent to any part of the country for $1.05.

The regulations on air mail are simple. Any mailable matter (except perishable matter liable to damage by freezing) may be sent by air mail. Registered, insured and C. O. D. matter is carried by air mail as are packages not exceeding fifty pounds in weight and not exceeding 84 inches in length and girth combined. Special delivery stamps still further expedite delivery of domestic air mail.

Air mail may be deposited in any mail box, but sufficient time should be allowed for collection and transport to the Main Post Office in time for shipment to the air mail field. Distinctive air mail envelopes are desirable, but not compulsory, but the words "Air Mail" or "Via Air Mail" must be clearly endorsed on the envelope or wrapper.

This new low rate effective August 1, holds out tremendous possibilities for the American business man. This reduction comes when the air mail companies are giving the most dependable service in their history. The man or woman using air mail for business or social correspondence has the benefits and connections of twenty-eight mail routes over 12,457 miles, serving 62,000,000 people directly and millions more indirectly. Each twenty-four hours the mail planes fly 24,914 miles and their daily average mail load now exceeds three tons. Air mail averages more than 100 miles per hour and planes are flown night and day in fair or foul weather.

Speed is the essence of air mail service and the record of efficiency established by the air mail in the last ten years, during which time nearly 16,000,000 miles were flown and 302,000,000 letters carried, merits the patronage of every business man and woman.

It behooves every alert business man to instruct his mailing department to determine where and how time and money can be saved by use of air mail. Each day there is some striking instance of how air mail, which means speed, has been profitable to American business. The new rates effective August 1 should popularize this rapidly expanding method of modern transportation.

New Company to Acquire Kimberly-Clark and Spruce Falls

Announcement is made that the Kimberly-Clark Corporation will be chartered under the laws of Delaware to acquire the assets and business of the Kimberly-Clark Company, which holds majority ownership of the Spruce Falls Power & Paper Co., Ltd., the remainder being held by the New York Times Company.

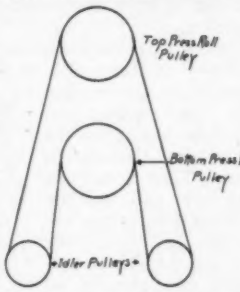
The Kimberly-Clark Company manufacturers chiefly book papers for magazines, supply more than fifty national magazine publishers. Its rotogravure paper is used in about 90 per cent of the United States publications using that product. The Spruce Falls Company, which represents a total investment of 27,000,000, has a long term contract to supply the New York Times with its entire newsprint requirements, accounting for more than 50 per cent of Spruce Falls capacity.

The Kimberly-Clark Company directly and through a subsidiary owns seven plants at Neenah, Appleton, Kimberly and Niagara, Wis.; and at Niagara Falls, N. Y. Production of paper in 1927 amounted to more than 141,000 tons and for the first quarter of 1928 to more than 38,000 tons. The Wm. Bonifas Lumber Company, a wholly owned subsidiary, has timber supplies estimated as sufficient for more than 25 years operation of the seven plants at present capacity. A large part of the timber on its land consists of hardwood, not used in its own operation, but sold at substantial profit to other industries.

Practical Helps for the Mill Man

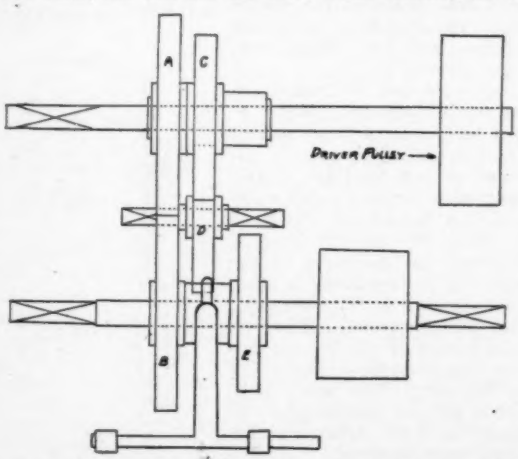
Belt Driven Press on Cylinder Machine

IN A CYLINDER machine installation producing container board stock, the top and bottom rolls of the first press were geared together with spur gears. The grinding of roll faces caused this drive to become objectionable. The slight difference in diameter of the rolls made sufficient difference in the actual operation of the rolls to cause the board stock to buckle on the felt in the nip of the rolls. To eliminate this difficulty, pulleys were substituted for the gears, and with an idler arrangement and belt drive as illustrated, the press has been functioning very satisfactorily. The belt was of the link-leather type which permits necessary slippage without burning of belt. This press rolls drive arrangement eliminates the gears, permits greater flexibility in the operation of the press and has overcome the tendency of the stock to buckle in the nip of the rolls.



A Unique Winder Drive

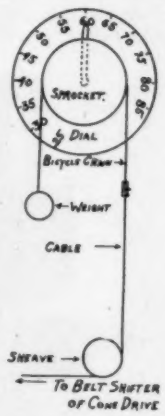
THE superintendent of a board mill which was directly connected with a container converting plant was requested to supply the paper to the converting plant in rolls sometimes with the wire side out and sometimes with the top side out. This request was due to conditions in the press room where the stock had to be printed. To eliminate the necessity of rewinding was, therefore, the problem at hand. After some consideration it was decided to install a power transmitting device that would permit a change in direction of rotation of the winder shafts without the use of two belts, one belt for the drive when rotating the shaft



in one direction and another belt when the shaft was being rotated in the opposite direction. The idea developed from familiarity with an automobile transmission and simply consisted of several gears and clutch arrangement. As much of the old drive as could be salvaged was used in the construction of the new device. Only such parts as were required to make the drive a complete working unit were added. The layout of the complete drive is illustrated. Gears (E) and (B) are located on same shaft in a manner that will permit them to be moved or shifted together along the shaft. In this way when Gear (E) is disengaged with its corresponding gear (D), gear (B) is engaged with (A) through which it is driven. If the direction of rotation is to be changed, it is simply necessary to disengage (B) with (A) and to engage (E) with (D) which is driven through (A), thus reversing the direction of rotation. The device is simple and has made a most satisfactory drive for the purpose for which it was designed.

Quick Change Device for Board Machine

A MASTER mechanic in a board mill noticed considerable broke was formed in changing the cutters of the machine from one length sheet to another. To reduce this waste to a minimum was his desire. He conceived and made a device to permit the change in the length of sheet almost instantly and yet accurately. The mechanism was developed from a small sheave, old bicycle sprocket, a few feet of bicycle chain, a number of feet of $\frac{3}{16}$" flexible cable, a small weight, and some galvanized iron. One end of the cable weight, and some galvanized iron. One end of the cable was attached to the belt shifter on the Moore and White speed cone drive. This drive was located a floor below the cutter installation. The opposite end of the cable was extended through an opening in the floor above and was attached to one end of the bicycle chain which in turn was kept taut over the bicycle sprocket by means of a small weight at the opposite end of the chain. A dial and hand were made from the galvanized iron. The dial was graduated in inches corresponding to the shortest and longest sheets to be cut by the cutter. This dial and hand arrangement was attached to the bicycle sprocket with the face of the dial facing the backside of the sprocket and the hand of the dial so that it would move along the face of the dial with the movement of the sprocket. A change in the cutting of sheet lengths can be made by simply shifting the screw on the cone drive to the point desired and registered by the hand on the dial. Changes from 20" to 75" can be made very quickly. This device has not only saved time in the operation of the machine but has cut down tremendously the loss of sheets while adjusting the machine.



Institute of Chemistry

The second session of the Institute of Chemistry of the American Chemical Society will open on July 23 at Evanston, Ill. There will be a garden party in the afternoon in special honor of the president of the American Chemical Society, S. W. Parr, professor emeritus at the University of Illinois, Dr. Charles L. Parsons, secretary of the American Chemical Society, and Dr. Harrison E. Howe, editor of Industrial and Engineering Chemistry.

The list of speakers who have accepted invitations to speak during the sessions which will continue from July 23 to August 18, includes leading scientists and industrialists of the country. On the second day, there will be a symposium on cellulose, and G. A. Richter, director of research of the Brown Company, Berlin, N. H., will discuss "The Preparation of Alpha-Cellulose from Wood Pulp." Dr. A. W. Schorger, of the C. F. Burgess Laboratories, will take part in the discussion of "The Chemistry of Cellulose."

John Duers, 67, for many years a resident of Hudson Falls, N. Y., died last month in Hopewell, Va. He was for many years superintendent of the Union Bag and Paper Corporation of Hudson Falls.

Carbon Pile Type of Voltage Regulator

By J. H. ASHBAUGH
Westinghouse Electric & Manufacturing Company

THE majority of effort in the field of automatic regulation has been confined to alternating current generators. This has been due to the poor inherent regulation of this type of machine as compared to the direct current generator. The necessity for a voltage regulator on direct current generators is small, due to the ease of adding compounding coils to the machine, thereby giving them flat characteristics from no load to full load.

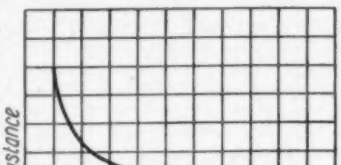


Figure 1

There are many industrial applications where direct current generators supply power to variable speed motors. The manufacturing process often requires close voltage regulation and over a considerable range. A direct current generator which is flat compounded at normal voltage, full load will have a slightly rising characteristic at half load. Furthermore, at reduced voltage the no load, full load characteristic will be rising, the amount being proportional to the reduction in voltage. These conditions dictate that an automatic voltage regulator must be used.

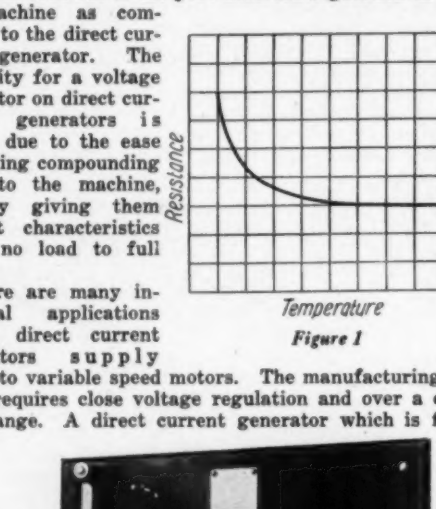


Figure 2

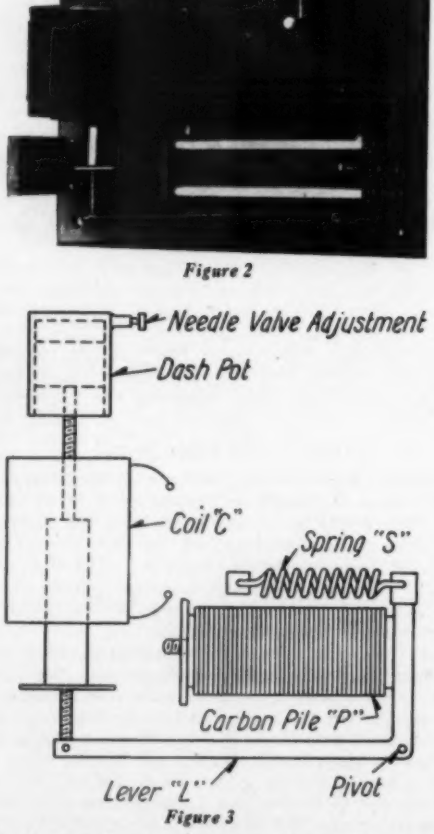


Figure 3

A carbon pile type of regulator has been developed to meet the demand for a direct current regulator which would be free from all maintenance, rugged in construction, simple in operation and accurate in performance.

The use of a carbon pile as either a resistance or as part of a voltage regulator is in itself not new. When a carbon pile is used as a straight uncontrolled rheostat, it is neither constant nor stable and therefore is not acceptable for this service. However, when used in connection with a device to control it, such as in a regulator, it does not matter whether it is constant or stable, so long as neither vary rapidly. Figure 1 shows that the constancy or stability of the pile is a slowly varying function, that is, change of resistance with temperature. The regulator is shown in Figure 2.

Figure 3 is the diagram. The coil (C) pulls its solenoid attached to lever (L) in an upward direction against the tension of the spring (S). The carbon pile (P) has the pressure reduced by this movement. Thus it is seen that the pull on the solenoid determines the position of the lever (L) and as this determines the amount of resistance in the carbon pile, it follows that the coil determines the amount of resistance in the generator field and consequently its voltage.

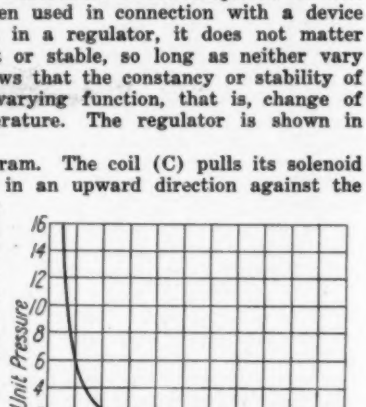


Figure 4

Figure 4 is the characteristic curve of the carbon pile with resistance plotted against pressure. The value of resistance can be varied by varying the length of the pile, thickness of the disc and diameter of the disc.

When a load is placed on the generator and the voltage reduces in value, the pull on the solenoid is reduced. The spring then overcomes the pull and the core and the lever move to a new position, reducing the resistance in the field circuit. The voltage of the generator then increases and when normal voltage has been restored to the generator, the pull on the solenoid just balances the spring tension. The regulator is then in equilibrium and the voltage correct and constant.

In any regulator it is necessary to use some device or method to prevent the regulator from swinging the voltage. The common expression is anti-hunting means. The necessity for this reactionary element is a function of the speed with which the correct force is applied and the response of the machine. If the regulator is made sluggish, or slow in its movement, hunting will not result. However, the restoration of the voltage under varying conditions would not be satisfactory. The mere addition of a dashpot would make the regulator slow to correct voltage but free from hunting.

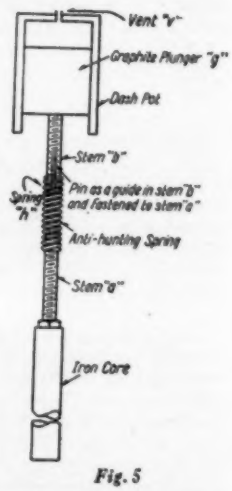


Fig. 5

The anti-hunting feature of this regulator consists of a dashpot which is spring coupled to the lever. Figure 5 shows how the actual mechanical construction is made.

The spring coupled dashpot permits the lever to move freely and instantly to initiate corrective measures. If the dashpot plunger could not move, the dashpot spring would cause the regulator to have a drooping characteristic, that is, the more load applied, the lower the voltage. Thus the anti-hunting feature consists of a variable recalibration. When a load is thrown on the machine, the regulator lever (L) moves down, compressing the pile. The spring (H) is stretched so that if the plunger (G) did not move, the regulator would reach equilibrium below normal voltage.

However, the plunger (G) is not fixed so that the regulator is only temporarily re-calibrated. As the voltage comes up to normal, the plunger (G) moves down allowing the regullator calibration to return to normal. The vent (V) is adjusted so that if the voltage is restored to normal, the re-calibration will be made at the same rate.

The method of using a loose coupled dashpot insures a very rapid and quick acting regulator, yet free from entangling and complicated anti-hunting means.

Strict attention to details of design use of established materials and the incorporation of precision elements have made the regulator an accurate piece of apparatus, yet rugged and reliable. Figure 6 is the schematic diagram showing how the regulator is applied.

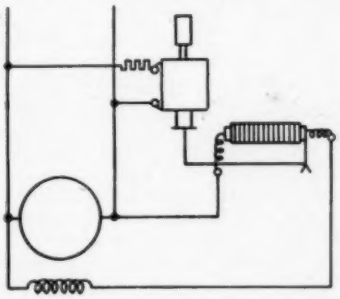


Figure 6

One particular field where it has found much favor is in the paper industry. Both the single motor and sectional paper machine drives have used this regulator for some time. Once it is installed and adjusted, no further attention or maintenance is required.

Leather Belting Chalks Up Remarkable Record

Many just claims are made to the advantages of leather belting for its strength and endurance and a notable example of these qualities is given in a story of a remarkable installation by Army Adams of Grass Valley, California.

"In November, 1905," writes Mr. Adams, "I started to work for the Liberty Bell Gold Mining & Milling Co., of Telluride, Colorado, in its 80 stamp mill. We had four 50 h.p. motors each pulling 20 stamps, 24 hours per day, 363 days per year —the mill was idle for repairs on the Fourth of July and Christmas. On one of these motors there was a 10 in. two ply, endless leather belt, traveling from a 16 in. crowned driver to a 60 in. driven pulley on a counter shaft that in turn drove the cam shaft of the batteries.

"When I severed my connection with the company in 1918, the belt was still pulling its 50 horse load after 13 years of continuous service. It stands to reason that during this time it received the best care, otherwise it could not have withstood the strain.

"How long this belt had been running before I became familiar with it, I have no means of knowing, but I think I am making a conservative statement when I say this belt traveled over 5,000,000 miles pulling its 50 horse load. Or, stating it another way, in lifting twenty 1,00 pound stamps more than 1 times per minute it lifted over 7,000,000,000 tons of steel and iron in the 13 years of its work. The belt was still in operation when the mill was dismantled in 1920-1921."

Among the many messages going to King Gustaf V. of Sweden, whose 70th birthday was celebrated by the Swedish people on June 16th, was a cable of greeting from the American Paper and Pulp Association in expression of its appreciation of the friendly relations existing between the pulp and paper industries of Sweden and the United States.

M. M. Cohen, paper and twine merchant, formerly located at 451 Washington street, New York, has removed to 337-341 West Sixteenth street, where he has double the amount of floor space on the street floor and basement, and where his added facilities will enable him to better serve his customers and permit him to carry larger stocks. The company, which specializes in wrapping paper, was established in 1904.

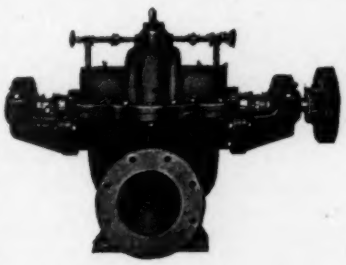
The Mill Specials Paper Company, of New York City, was incorporated on June 19 by Ridgway, Ridgway & Slote, of 41 Park Row, New York. This new concern has a capitalization of $20,000.

A New Improved Centrifugal Pump

A new improved design of general service pumps has recently been developed by the Lawrence Pump & Engine Co., of Lawrence, Mass., known as the Lawrence "Vortex" type "S. S." These high efficiency, horizontal split pumps embody all of the good features heretofore found in high grade centrifugal pumps, and overcome many troubles with which the operating engineer had to contend.

End thrust has been entirely eliminated by an automatic internal hydraulic balancing chamber. There are no rotating parts, and no wear in connection with this balancing device, and its efficient operation is not effected by long service.

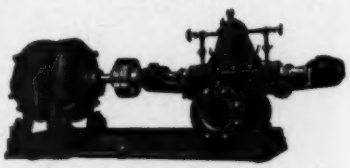
Another feature of the pump is the special bronze wearing rings of the indirect flow multiple ring type, made of a bronze composition entirely different from the impeller into which they fit. This prevents any sizing of the two parts, and the multiple-ring type reduces leakage from the high pressure chamber back into the suction to a minimum.



Type S. S. double suction, horizontal split shell ball bearing pump

The pumps are equipped with oversize deep-grooved ball bearings mounted in dirt and grease sealed housings—one located on each side of the pump outside of the stuffing box. Ball bearing housings are horizontally split, thus permitting the quick removal of the entire rotating element of the pump, if desired.

Standard equipment is bronze fitted throughout, which includes an enclosed balanced impeller of the non-overloading type; special wearing rings of the multiple-ring type; bronze covered steel shaft where it passes through the pump and stuffing boxes. Bronze shaft sleeves are removable, and are securely held to the shaft by keys and external nut. The stuffing boxes on both sides of the pump are very deep so as to avoid excessive pressure of the packing on the shaft, and each is provided with a bronze water sealed ring which is connected to the discharge chamber of the pump through external piping. A split stuffing box gland is arranged with swing bolts.



Type S. S. double suction pump direct connected to motor

All units are equipped with a flexible coupling of the pin and steel lined rubber bushing type, between the pump and the prime mover. Each pump is mounted on a heavy cast iron base plate which is substantially ribbed. This base plate is of the boxed type and extended to support the driver, machine faced pads being provided for the mounting, together with a raised lip and drain connection.

The pump is built for direct connection to electric motors, steam turbines, gasoline engines or for belt drive. Capacity is 50 g. p. m. to 5000 g. p. m. Heads on larger sizes are made up to 250 feet. The pumps are especially recommended for handling clear water. A copy of Bulletin D-20 giving complete information and data can be obtained by writing to the manufacturer.

Printing Machinery Mfrs. Consolidate

An event of major importance in the printing and allied trade is the recent consolidation of the United Printing Machinery Co., Boston, with the Kidder Press Co., Dover, N. H. The merger also includes the National Machine Co., at whose plant in Dover, N. H., the products of the United Printing Machinery Co. have for years been manufactured.

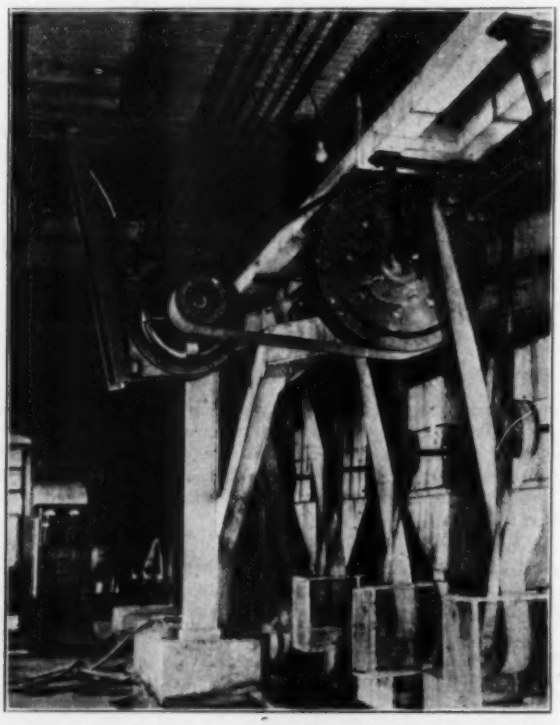
The new company, which is styled the U. P. M.-Kidder

Press Co., Inc., will continue the service of the Kidder Press Co. in the designing and building of special presses for a wide variety of commercial printing, in addition to this company's standard and adjustable presses which have had widespread adoption among printers of wrappers and containers for various classes of merchandise.

Among the management of the new company are men well known to the printing trades through their long connection, in administration and sales functions, with the interests involved. Joel F. Sheppard, previous owner of the National Machine Co., and for about a year in charge of the Kidder Press Co. plant in Dover, is the general manager. B. F. Upham, former head of the United Printing Machinery Co., and an inventor of note in the printing machinery field, will serve the enlarged company in an advisory capacity in connection with technical and trade matters. J. B. Gibbons will continue the duties performed by him as secretary of the U. P. M. Co. and will have charge of sales and publicity. D. H. Speidel will remain in control of the Western territory with headquarters in Chicago as heretofore.

A New Short-Center Drive

Objection on the part of some engineers to short-center drives can be readily overcome by an investigation of tests made with a new drive known as the "Uni-Pull," manufactured by The Rockwood Manufacturing Company, Indianapolis, Ind. In a test conducted by the manufacturer, belts



are being run at centers so close that the pulleys almost touch. In one installation, an ordinary lead pencil could be inserted between the pulleys.

For the Uni-Pull drive is claimed a marked improvement in operating efficiency over fixed-center belt drives, and it is particularly well adapted to close pulley centers. It operates at all times with uniform tension, uniform pull and uniform speed.

Briefly, this drive consists of a Rockwood pulley and a motor, so mounted that gravity weight maintains the belt under a predetermined tension to meet the power requirements of the installation.

In belt drives, the pressure between the belt and the pulley is the controlling factor in belt pull. To transmit a given horsepower, a fixed tension is required, but to maintain this tension it has been necessary to set the initial tension far greater than the desired tension to allow for belt stretch. Also in fixing the tension, it is necessary to allow for the effect of centrifugal force. Centrifugal force increases as the square of the speed, and the effect in fixed-center drives at extremely high speeds is to lift the belt entirely from the pulley.

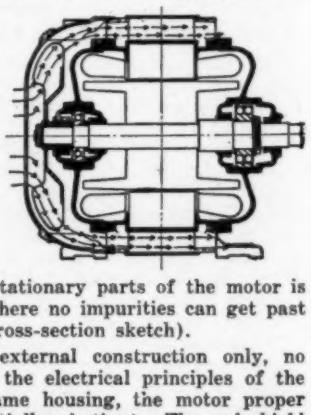
With the Uni-Pull drive, the method of mounting makes possible the maintenance of the tension entirely independent of the effect of centrifugal force. Also with this drive, there can be no temporary strains due to shrinkage due to atmospheric conditions.

The illustration shows a ceiling mounting of a Rockwood Uni-Pull drive installed at the LaFayette Box Board and Paper Co., LaFayette, Indiana. A 60 h.p. General Electric motor running 720 r.p.m. is driving an overhead line shaft with a 50" pulley running 180 r.p.m. through a rubber belt ⅞"x14"x218", traveling 2430 f.p.m.

The manufacturer has applied for patents covering the drive and proposes to license its use at a very nominal price to insure correct design and satisfactory results from the installation.

Wagner Air-Jacketed Motors

An air-jacketed motor for serving where dust, fumes and moisture are present in sufficient quantities to necessitate protection to motor and property, has been developed by the Wagner Electric Corporation, St. Louis. The entire motor is surrounded by a jacket open at both ends with fan blades on a shaft extension, between the sealed motor and its outer jacket. The only clearance between rotating and stationary parts of the motor is in the bearing housing, and here no impurities can get past the grease packing. (See cross-section sketch).



The motors are new in external construction only, no changes have been made in the electrical principles of the motors themselves. The frame housing, the motor proper and all bearings are substantially air-tight. The end shield is made of cast iron, rib-reinforced and has a substantial grating which protects the fan and provides an opening for incoming ventilating air. The center shield is made of heavy sheet steel held in place by slot head bolts. The fan is of one piece construction. The conduit box is mountable in four positions.

The stator is the only part of the standard single phase repulsion-induction and polyphase squirrel cage motors subject to change in design. The exposed outer rim is deeply grooved to increase radiation surface. The punching for windings remains unchanged. The stator laminae are welded together to lessen vibration and reduce magnetic noises.

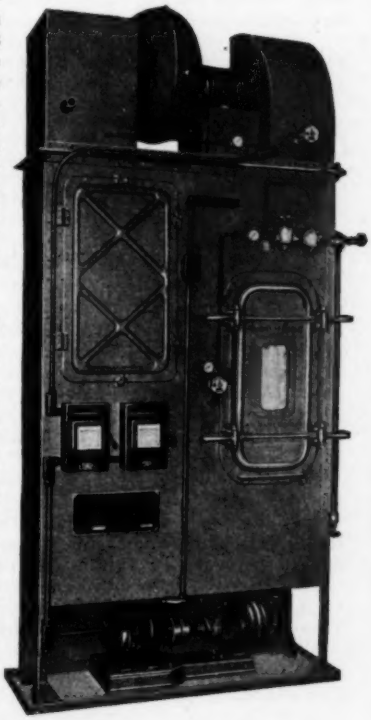
The motors are double row ball bearings, self-aligning in one end plate and deep groove in the other to take end thrust. Bearings are grease lubricated, sealed in dust-proof housing. The shafts are made slightly longer than those fo rstandard motors to permit fan mounting. Single-phase repulsion-induction motors may be had in sizes from one to 20 h.p. and polyphase squirrel cage motors in sizes from two to 30 h.p. These motors are designed for a temperature rise not to exceed 50 degrees centigrade and meet all A.I.E.E. and N.E.L.A. standards.

Francis A. Emmons, sales and advertising manager of Foote Bros. Gear & Machine Co., Chicago, was elected president of the Engineering Advertisers Association of Chicago, at its annual meeting June 4th.

New Unit Systems for Air Conditioning

It is common knowledge around a paper mill that the physical properties of paper vary according to the moisture content, resulting in a decrease or increase of bursting, tearing, and tensile strength variations in the folding endurance of the paper stock.

With such conditions existing, it is of extreme importance that the physical testing of paper be conducted in an atmosphere of constant temperature and humidity, and under such conditions consistent results may only be obtained in the same laboratory, or in a different laboratory. Paper testing laboratories which are equipped for control of temperature and humidity commonly maintain the standard condition of 50 to 65 per cent at 70° Fahr.



The first condition is more easily obtained during the summer months when humidities are high, but the second condition approximates more closely the humidity under which paper is actually used.

The Clarage Fan Company at Kalamazoo, Michigan, have recently developed a line of unit air conditioning equipment to meet the requirements of the paper industry. These units not only provide a uniform circulation and distribution of the air, but are provided with all necessary control devices for maintaining constant conditions of temperature and humidity for any process or space condition.

The units not only wash the air but will heat or cool, as required.

Particular attention has been given to compactness of design, and operation with the minimum amount of attention.

The power requirements are exceedingly small with high operating efficiency.

This equipment will provide, at a low cost for small space requirements, the results which heretofore have been impossible to obtain without excessive expense for a central station system.

The humidifiers have been developed in two types with a range of capacities sufficient to meet the demand of general application, and where larger space conditions exist the same results are obtained by using multiple units.

The Type B unit, shown in the accompanying illustration, is particularly adaptable for laboratory purposes, in that an exceedingly precise control may be obtained, and in addition to humidifying, will dehumidify when a source of cold water or refrigeration is provided.

This unit is made in a capacity range of from 1200 to 6000 c. f. m., and with floor space of 16 x 60″ for the smaller unit, and 36 x 72″ for the larger unit.

The Type I unit is particularly adaptable for large area conditioning, and all forms of paper manufacture or storage.

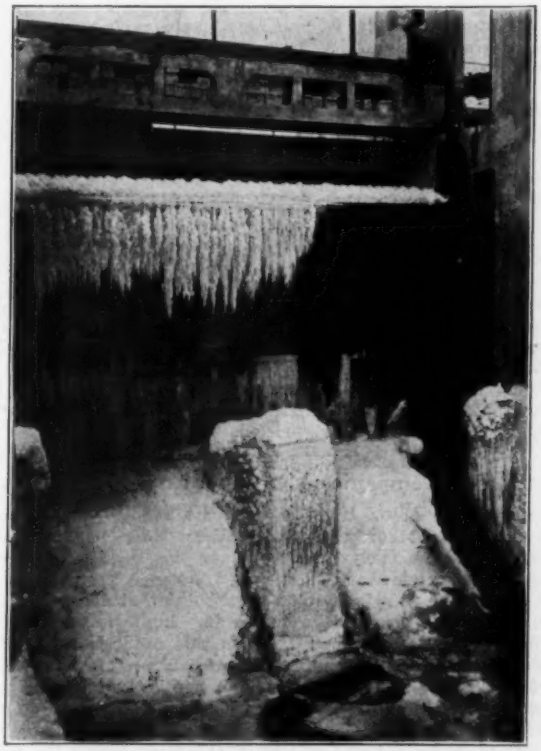
It is listed in two sizes which may be installed either for single or multiple application, according to the requirements of a given space.

This unit is of a particular rugged substantial design, completely equipped with all control devices for maintaining constant temperature and humidity, and requires the minimum power for operation.

Due to the design feature of radial air distribution, extremely uniform condition and circulation is maintained.

Keeping Intake Screens and Sluice Gates Free of Ice

Dr. Franz Berger states in the **Siemens-Zeitschrift** of October, 1927, pp. 688-691, that the paper mill at Gratwein, province of Styria, southeastern part of Austria, has installed, through the Siemens-Schuckert-Werke, an electric heating system on the fine screens and another on the sluice gate, in order to prevent the freezing on of ice. A transformer of 95 kv. a. capacity and output valtage of 110 volt is employed with the screen heating system. The heating system of the sluice-gates is connected directly to the available 300-volt power supply; about 20 kw. are required for heating both sliding surfaces facing the sliding gate; the capacity is subdivided so that any part of the surfaces may be heated, depending on the water conditions and the weather. The accompanying illustration shows one side of the sliding surface. Although it is covered considerably with ice, the installation



Electrically heated sluice gate at the paper mill in Gratwein, Austria

of the heating system, in which the current is passed through the surface to be heated—in this case the inner sides of the sliding walls—keeps the walls on the outside entirely free of ice, thus assuring operation under severest freezing weather. In the heating system of the screens the current is passed directly through the screen rods and it is turned on just before the water reaches the freezing temperature. Thus only a low percentage of the current generated by the turbine is required for heating, and since only a limited volume of water may be available during freezing weather, only the center portion of the screen need be heated as is the case at Gratwein. If the current were turned on after ice had once been formed on the screen, the output of current required for thawing up would became too expensive; therefore, it is best to forestall any formation of ice. The installation at Gratwein has proved quite satisfactory.

A Piping and Valve Recommendation Chart

The Walworth Company, with general offices in the Statler Building, Boston, Mass., and general sales offices at 51 East 42nd Street, New York City, have issued recently a piping and valve recommendation chart for sulphite pulp mills.

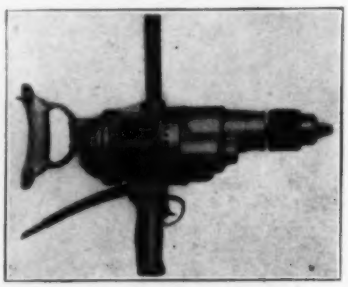
The chart is 11"x38¼" and has been printed in several colors to emphasize the piping and valve requirements of a sulphite plant. The acid lines are in brown, water lines in green, bleach and stock lines in yellow, high pressure steam lines in light blue, low pressure steam lines in dark blue, and exhaust steam lines in red.

Major equipment connected with acid manufacture, pulping, screening, thickening, bleaching, power, etc., are diagrammatically illustrated in the piping layout, making it possible, therefore, to follow the process of manufacture from the burning of sulphur and generation of steam to the bleaching, washing, and storing of the pulp. Such a chart might be conveniently framed and would serve as a ready source of reference when considering piping and valve requirements of sulphite mills.

A copy of the chart will be mailed to those who request it.

A Heavy Duty Electric Drill

Maintenance crews in pulp and paper mills will find the new ¾-inch, heavy duty, portable electric drill recently put on the market by Black & Decker Co., Towson, Maryland, a tool which is ideally adapted to do service work where constant service is essential.



This drill is equipped with an exceptionally powerful universal motor, operating on direct or alternating current, and the armature and spindle thrust are mounted on ball bearings. The 3-jaw geared chuck uses straight shank bits and the tools will readily drill holes up to ¾" in diameter in the toughest steel. List price is $78.00.

Paper Companies Use High Pressure Boilers

The Edge Moor Iron Co. held its regular annual sales meeting at the company's plant, Edge Moor, near Wilmington, Dela., the early part of June. H. B. Bradford, vice-president, presided.

One of the principal topics of discussion at the sales meeting centered around the increasing high pressures being adopted by various industries. In this connection, the Edge Moor Iron Co. is now building two 650 lbs. pressure boilers of 1174 boiler horsepower each, for the Waldorf Paper Products Co., St. Paul, Minn. This is possibly the highest pressure ever used in the paper industry. The first boiler will be shipped in August and will be in operation before the end of the year.

The decision to install high pressure boilers in the Waldorf plant is in line with the present tendency in the Paper Industry to increase pressures. This is due to the more efficient operation of the turbines which high pressures make possible, also to allow for bleeding the turbine for the steam required in the process work ordinarilly around 200 pounds.

The pressure usually adopted in the paper industry heretofore has been between 400 and 450 pounds. The Waldorf Paper Products Company, however, after a careful study of all operating conditions, as well as a survey of their individual requirements adopted pressures considerably above the regular average.

The new Waldorf steam plant is now under construction. The high pressure boilers will be shipped by the Edge Moor Iron Company in August. The new plant is expected to be in operation before the end of the year.

Other companies in the paper industry to adopt higher pressure boilers are West Virginia Pulp & Paper Co., who operate Edge Moor Boilers of 425 pounds pressure. Two boilers of 825 boiler horsepower each were installed in 1927 and have been in operation just about a year. Two additional boilers of the same pressure and horsepower have been ordered from Edge Moor Iron Company and will be shipped in July of this year. The Warren Manufacturing Co. is another concern in the industry to install high pressure boilers. At its Milford, N. J., plant this company has installed one 512 h.p. Edge Moor boiler built for a working pressure of 385 lbs.

With the exception of the 650 lbs. pressure boilers for the West Virginia Pulp & Paper Co., all of the above high pressure boilers are of the Cross Drum Box Header type.

Paper Makers Chemical Co. Reorganized

The Paper Makers Chemical Company, which has operated separate units throughout the United States, has reorganized and consolidated these subsidiaries into one large corporation under the name of Paper Makers Chemical Corporation. The new company is capitalized at $8,000,000.

The corporation's reasons for the consolidation and the stating of its policy was made in an announcement to the paper and allied industies as follows:

"In order to give better and more efficient service, and to carry on more united and effective research in its customers' problems, and to effect economies which will benefit the trade served, the following companies announce a reorganization and consolidation of interests: Paper Makers Chemical Company, Western Paper Makers Chemical Company, Vera Chemical Company Corporation, Adirondack Mineral Company, Superior Sizing Company, John Regnier and Son Company, and the Keystone Products Company."

These companies which have heretofore been separate and distinct units with individual policies will now be operated under one management. The present personnel of these organizations will be united to serve the paper industry under one name—Paper Makers Chemical Corporation.

This new company also announces control and management of the following subsidiary organizations: Superior Pine Products Company, Suwannee Forests, Echols and Clinch counties, Ga., Vera Chemical Company of Canada, Ltd., Burlington, Ont., Canada, Georgia-Louisiana Corporation, Atlanta, Ga., and New Orleans, La., and the Empire Size & Chemical Corporation, Albany, N. Y.

The control of the Superior Pine Products Company gives the corporation over 200,000 acres of pine forests which will furnish an almost unlimited supply of refined rosin, turpentine, and other products to its various plants.

The new corporation will have plants in Kalamazoo, Mich., Comstock, Mich., Holyoke, Mass., Boston, Mass., Stoneham, Mass., Pensacola, Fla., Jacksonville, Fla., Savannah, Ga., Atlanta, Ga., Marrero, La., Easton, Pa., Albany, N Y., Carthage, N. Y., Lockport, N. Y., North Milwaukee, Wis., Fargo, Ga. and Burlington, Ont. The Pochins and Paper Makers Chemicals, Ltd., of Erith, Kent and Manchester, England, will also be associated with the new corporation.

The products of the corporation are principally chemicals used in the paper and allied industries.

Today the corporation is among the largest of its kind in the world.

Utilization of Pulp and Paper Mill Wastes

The National Committee on Waste Utilization and Stream Improvement met recently at Buffalo, N. Y., when reports of the committee's work and activities in stream improvement were submitted by the representatives of paper and pulp manuacturing plants from several States.

John D. Rue, of the Champion Fibre Company, Canton, N. C., who is chairman of the committee, presided. In opening the meeting he outlined the functions of the committee and indicated ways and means of carrying on the work, the importance of which was emphasized by several mill executives in attendance. "Efficient utilization of waste is necessary for the preservation of the industry" was the way one prominent paper mill executive phrased it.

It was pointed out by Major O. M. Porter, secretary-treasurer of the American Paper and Pulp Association, that

the National Committee of the Pulp and Paper Industry on Waste Utilization and Stream Improvement was composed of representatives from the industry, as well as State officials, so as to develop constructive coöperative programs in waste utilization and stream improvement. He said he had been authorized by the executive committee of the American Paper and Pulp Association to raise funds for the extension of the committee's work.

Instances of Profit—In one of the reports submitted at the meeting there was instanced a case of utilization of waste both to the financial advantage of a paper mill and improvement in stream conditions. This mill had been faced with the necessity of building a new well to augment its water supply, but by a revision of process through a program of waste utilization the drilling of a well had been avoided and a reduction of 40 per cent in the amount of water formerly used was effected. In another instance, the volume of water used in a mill had been reduced from 28,000 gallons a ton of product to 8,000 gallons a ton and it was expected that this amount would ultimately be lowered to 3,500 gallons.

To Study Waste Liquor Problems—Important action was taken in the direction of coping with the losses and annoyance connected with the disposal of sulphite waste liquor. The National Committee was authorized to appoint a subcommittee representative of the sulphite mills to review developments in the utilization, treatment, and disposal of sulphite waste liquors. This committee will operate to foster research on problems of this kind and develop constructive plans for measures looking to their solution.

In regard to the standardization of procedure in analytical determinations, it was agreed that there were two practical lines of standardization: first, regarding analytical procedure, which was deemed a matter of consideration for the various State sanitary engineers and the American Public Health Association; and second, standardization of units within the industry, which was considered to be primarily a matter for consideration of the industry and one that might well be referred to an appropriate committee of the Technical Association of the Pulp and Paper Industry.

Recommendations of the National Engineer—C. M. Baker, engineer of the American Paper and Pulp Association, submitted a report containing a number of recommendations, as follows:

1—Policies for co-operative effort.

2—Organization of State committees representive of the industry to co-ordinate local, State and national activity.

3—Organization of research in waste utilization and stream improvement in various specialized groups of the industry; specifically
   (a) Sulphite mills, by the appointment of a special or subcommittee of the national committee.
   (b) Paperboard mills, through a committee to be appointed by the Paperboard Industries Association.

4—Standardization of procedure in analytical determinations, and the reporting of statistical data relating to the subject of waste utilization and stream improvement.

Policy and Objectives of the National Committee

The policy and objectives of the National Committee on Waste Utilization and Stream Improvement were stated by Chairman Rue and adopted as follows:

1—To foster but not to direct research.

2—To correlate such research data as may be released by the several research agencies.

3—To co-ordinate research agencies and where possible to aid in the elimination of unnecessary duplication of effort.

4—To co-operate with the Forest Products Laboratory in developing and co-ordinating research in waste utilization and stream improvement.

5—To assist in the establishment of State committees where such committees may be desirable, and to co-ordinate the activities of such committees in the several States.

6—To co-ordinate the activities of groups of mills manufacturing the same produce, as e. g., sulphite mills, strawboard mills, deinking plants in book mills, etc.

7—To co-operate with other agencies in avoiding undesirable legislation and securing legislation that will tend to promote sound practice in the reduction of waste and improvement of streams.

8—To act as agency for the dissemination of information released by the research agencies.

9—To act as agency for the exchange among the mills of information regarding improved operating methods insofar as such can be released for general use by the industry.

10—To provide the executive committee of the national association with a budget of expenses. The Committee on Waste Utilization and Stream Improvement is not to be held responsible for the raising of funds, that being recognized as a function of the executive committee.

Germans Honor American Pulp Engineer

At the summer meeting of the German association of pulp and paper chemists and engineers held at Heidelberg University on June 12 the chemical engineering achievements of Dr. Viggo Drewsen, of the research department of the West Virginia Pulp & Paper Company, New York, were recognized by election as an honorary member of the association, a tribute which must have been particularly pleasing to him, coming as it did so soon after the celebration of his seventieth birthday in New York.

Dr. Viggo Drewsen, who has been a citizen of the United States for many years, is of Danish origin, but of Norwegian education and of German chemical training. He was born near Copenhagen, Denmark, in 1858, but his family moved to Norway, where his father was the manager of a paper mill, when he was only a year old. He attended school in Norway and was graduated from the University of Oslo, going subsequently to Wiesbaden in Germany where he was private assistant to the famous Remigius Fresenius. He then went to Munich as assistant to Prof. Adolf Baeyer, and it was in the Baeyer laboratory that Doctor Drewson independently achieved the synthesis of indigo, which made his name widely known in the chemical world, as he was among the first to produce the substance by artificial means. He took his Ph. D. in chemistry, summa cum laude, at the University of Bavaria in 1882, the year before he made synthetic indigo.

Being descended from an old family of papermakers, whose connection with the industry in Denmark goes to the year 1700, it was natural that Doctor Drewson should turn his attention to the newer developments in pulp manufacture that were beginning to be heralded in the late eighties and he went over to technical pulp and paper studies, forming a connection with the Boehnsdalen sulphite pulp and paper mills at Boen in Norway, mills which are still in existence.

Doctor Drewsen has many achievements in the chemical engineering branch of cellulose work to his credit, a long list of patents being set against his name in the **Official Gazette** of the United States Patent Office, since he took up his residence here, some thirty-five years ago, but his earliest and perhaps best known contribution to scientific pulp manufacture was the invention of a method and process of recovering SO_2 gas in relieving digesters. He was one of the first chemists to undertake definite research for the utilization of sulphite waste and other wastes from sulphite pulp mills. He devised a method of heating the liquor under pressure with milk of lime whereby the sulphur was recovered in the form of calcium sulphite, lignin also being obtained. Rinman who followed him in this work, carried the process a step further, and apart from the Drewsen-Rinman developments little of value has since been accomplished in the direction of reclaiming constituents of the spent liquor or manufacturing by-products from it. Recently he has devoted his time to the working out of recovery methods for use in connection with the monosulphite process, a process which in his opinion is destined ultimately to displace the acid sulphite of lime method of cooking wood.

The Month at Washington

A SURVEY is being made by the Department of Labor through its Employment Service to ascertain the extent to which new labor-saving devices are displacing workers, and in future the various field offices will keep the Department advised of any labor-saving devices installed in industry to displace labor, the kind of installation and the number of men displaced, and statistical and informative data will be published from time to time to supplement the major report which is to follow from the survey.

Study of Advertising by Cities—Community advertising throughout the United States is described in a report (Series No. 21) just issued by the Department of Commerce, discussing community advertising problems and methods. The total advertising bill of the United States is estimated to be considerably in excess of a billion annually, but the social and economic effects of this vast expenditure are difficult to trace. Students of advertising admit that a large amount of fundamental research is urgently needed in order to determine the kind and method of advertising best suited to particular purposes. It is also admitted that considerable money is wasted because the appeals do not reach the public group where they would be most effective. Advertising agencies and associations are conducting much research on these subjects, and the fact that they are appropriating large sums of money for the establishment of foundations to study the economics of advertising is evidence of the importance of the subject. In connection with certain parts of this work it is pointed out that the Government may properly assist in this type of investigation.

Supreme Court Clears Docket—Just before adjournment for the summer the Supreme Court of the United States had disposed of 859 cases since the October term commenced, which while smaller than the number of cases disposed of in the previous term, left fewer cases remaining on the docket.

Trade Barriers—The United States is taking part in the second conference to discuss import and export restrictions and prohibitions now being held in Geneva, commencing July 3d. The first conference of its kind was held last October.

Tests of Fire Proof Safes—Fire resistive qualities of safes and other office record containers, and the intensity and duration of fires in buildings, were recently measured and recorded by the Bureau of Standards when an actual three story business structure (condemned for government use) was burned to the ground. Some 35 different makes of safes and containers were used. Each safe was equipped with thermometers and other recording devices to show the highest temperature reached within each and the moment of impact as they fell through the burned out floors into the debris below. When the complete data has been assembled and interpreted the results of the test will be made available in published form. While previous tests had been made in small buildings duplicating a fire in a larger structure, no tests had ever been made of a full-sized nonresistive structure.

Air Mail Service—Air mail service to link Canada and all points in the United States, and also with Mexico, as well as 13 ocean routes are now being negotiated by the Postmaster General.

New Special Handling Stamps—A new series of special handling stamps in denominations of 10, 15 and 20 cents were issued July 2d by the Post Office Department, to conform to the rates provided by recent postal legislation, which will also take the place of the 25-cent special handling stamp now in use. The new stanmps will be of the same size and shape as the current issue and will have the words "special handling" arranged in a semicircle directly above.

Restrictions on Mailing Permits—The Post Office Department has just made public its new regulations for the acceptance by postmasters of non-metered first-class mail, without stamps affixed, whereby all such pieces of mail must be identical as to weight and must be presented in a minimum of 300 pieces. Existing permits for mailing nonidentical pieces of first-class matter as non-metered mail remain in force until September 30th next, or during the life of any special machine used in such mailings which was acquired for that particular purpose. "Permit mail," as such, is a special service provided to the larger mail users in order to eliminate the necessity of affixing postage stamps on individual pieces. Under this system, users can print a number of their permit on the envelope and mail it without a stamp. The new regulations do not cover this phase, as it is to be remembered there are two ways of keeping account and collecting postage under permit systems: the non-metered and the metered system. Under the non-metered system the permit may be printed on the mail by any printing device such as a hand stamp, printing press or special permit and sealing machine. The letters are brought to the post office, and if they are all of the same size and weight they are counted by weighing the whole delivery, then weighing a sample piece and dividing that weight into the total weight, thus ascertaining the number of pieces, etc. This can only be done where the pieces are identical. It occurs more frequently in the lower classes of mail. In first-class mail the pieces are usually not identical but different in size and weight. Such "permit mail" must be actually counted by the postmaster in order to collect the postage at the time of mailing.

Rates of Postage Under New Law—Regulations and instructions necessary to carry out the provisions of the New Postal Rate Act which went into effect July 1st have been issued by the Post Office Department and are available for issue to interested parties. Among the new rates we find a reduction of the transient second-class rate to 1c for each 2 ounces or fraction, regardless of distance or weight. The establishment of pound rates on bulk mailings of identical pieces of third-class matter in quantities of not less than 2 pounds or 200 pieces, such rates being 8c a pound or fraction thereof for catalogs, etc., and 12c a pound or fraction for all other third class matter, with the proviso that in no case shall the postage be less than 1c a piece. The 2-cent service charge on fourth class matter is eliminated. Another provision in the new regulations permits the use of business reply cards and envelopes on which the postage is to be collected upon their delivery to the person or concern who distributed the cards or envelopes, a charge of not exceeding 2c over and above the regular postage to be made for this service.

Return Postage on Foreign Mail—There is no such thing as an international postage stamp that could be sent to any foreign country for reply postage, says the Postmaster General, but international reply coupons may be purchased and sent to any foreign country for reply postage.

Recent Income Tax Decision—A debt must be ascertained to be worthless and charged off before it may be deducted in computing net taxable income, and it is not sufficient that it may be known to be worth less than its face amount, or that a reserve shall be set up for the portion estimated to be uncollectible, says the U. S. Board of Tax Appeals in a recent decision (No. 14429).

Interstate Commerce Rulings—Rates on wood-pulp board in carloads from Ontonagon, Mich., to St. Louis were found

unreasonable in a recent decision by the Interstate Commerce Commission, and reparation was awarded, (No. 19969).

In Hutchison Paper Company vs. Chicago, Rock Island & Gulf Rwy., (No. 19814), the commission found a claim for reparation on a carload shipment of wrapping paper barred by the statute of limitations and the complaint was dismissed.

Proposed readjustment of rates on paper and part articles, in less than carloads, from Virginia cities, Baltimore and other eastern seaboard and interior eastern points to South Atlantic port cities and other southeastern points, were found justified in another decision (I & S Docket No. 3007).

Recent Customs Decisions—A miniature fourdrinier papermaking machine, imported solely for laboratory purposes, was the subject of a recent decision by the U. S. Customs Court (T. D. 42806). This machine was imported to use in determining the practicability of producing different and better qualities of paper than are manufactured on cylindrical machines, but was incapable of producing paper in commercial sizes or quantities. The court held the machine entitled to free entry under par. 1620 as a model.

Government Forestry Publication—The bi-monthly forestry publication, "The Forest Worker," has recently been enlarged from 24 to 32 pages, which will make available much additional forest information of a practical character obtained from Federal, state and private sources. The publication which comes out every two months gives helpful information for all those interested in forestry problems.

Improved Method of Handling Newsprint—Newsprint is one of the principal kinds of paper exported from the United States, total shipments last year amounting to 24,657,313 pounds. Most of the shipments are in rolls uncrated because the additional cost of crating is usually greater than the loss by damage caused by paper-wrapped rolls. Most of the damage is caused by dropping the rolls on edges or storing them against sharp objects which cut through layers of the paper. Special handling devices are now on the market for handling such paper rolls.

Nonabsorbent Paper for Testing Paints—A new type of paper, so treated as to render it nonabsorbent, has been brought on the market by a Liverpool firm for use in testing paints, varnishes, oils and distempers. It sells for $2.80 a ream for 5 ream quantities. The process of treatment is not patented, says an American consular officer at Liverpool, in a recent report.

Income Tax Decision—Traveling and entertainment expenses incurred by members of a partnership and their employees in carrying on its business, are deductible in computing the partnership's taxable income, when such expenses are shown to have been ordinary and necessary business expenses, says the U. S. Board of Tax Appeals in a recent decision (11173 and 11907).

Simplified Handling Methods—A conference of shippers, carriers and warehousemen was held recently by the Bureau of Standards to consider the use and extension through cooperative effort of simplified methods of handling, moving, loading and unloading goods; the development of interchangeability in the equipment required for handling goods; the establishment of such dimensional standards as may be necessary to secure interchangeability of equipment. The first effort toward reducing the cost of handling commodities will be directed toward bringing about interchangeability of skid and lift truck equipment.

Aeronautics Trade Directory—The Department of Commerce has just issued Aeronautics Bulletin No. 3, a directory of the aeronautics industry, Part I listing those firms selling aviation equipment, classified by commodities; Part II listing those firms and individuals concerned with air service activities, including aerial advertising and transportation of goods.

Cincinnati Trade Survey—A study of the trading areas for various wholesale trades about the City of Cincinnati is to be undertaken in the near future, to develop the possibilities in the wholesale trade of that territory. Consideration will be given in this survey to transportation rates and service, advertising, market facilities, competition from other cities, and other factors which in any way influence distribution.

Wholesale Prices—Continued upward movement of wholesale prices was shown for May by the Bureau of Labor Statistics, and compared with a year ago, shows an increase of 5¼ per cent. Minor increases are noted for textile and paper products. Using 1926 as the basis of 10 the following changes are shown for paper and pulp products:

1927 May	1928 April	1928 May	Purchasing power of 1926 dollar in May, 1928 (cents)
99.2	90.2	89.8	111.4

Commercial Labels—Commercial labels are properly registrable in the Patent Office, says the U. S. District Court (E. D. N. Y.) in a recent decision, where the plaintiff had certain sketches lithographed at great expense and also paid for the design sketches. It was contended that these must be registered in the copyright office and not in the Patent Office to be legal and valid, and that they were the subject of copyright rather than a patent.

Weights and Measures Laws—A revised compilation of the weights and measures laws of the states and of the United States, has just been issued by the Bureau of Standards, the only publication in this field and critically compiled so as to present the existing law.

Advertising Matter—"Shipment of Samples and Advertising Matter to the British Empire," is the title of Trade Information Bulletin No. 557, just released by the Department of Commerce.

Employment Statistics—The Women's Bureau has just issued some interesting statistics on the employment of women with causes for time lost. Women who work the longest hours were the most frequent absentees. The report points out that the length of the working day and good working conditions are essential to good work and that any other conditions result in less efficient production and a less stable working force. Time lost by the working force is a hindrance to promotion and the particular study in question is significant in pointing out the advantages of shorter hours not only to the employees but also to the employer. The study also points out that women leave their jobs less frequently than the men. A copy may be procured from the Women's Bureau, Department of Labor.

Census of Manufacturers—The Census Bureau has just released its consolidated report in book form of "The Biennial Census of Manufacturers for 1925."

Italian Paper Industry—There are 600 papermaking machines in Italy today as compared with 59 in 1862 and Italy is now seventh among paper making countries of the world. The total number of concerns is about 280, employing 27,500 people and controlling nearly 400 different mills. Last year the output of these mills reached 363,570 metric tons.

Checking Unfair Foreign Competition

Unfair foreign competition in the exporting of paper was discussed by Warren B. Bullock, manager of the Import Committee of the American Paper Industry, before the National Lithographic Association at a recent meeting in French Lick, Ind.

He mentioned a number of instances in which action had been taken involving foreign lithographed material, the Import Committee having taken this action because of the supplanting of domestic paper, as well as lithography, in such instances by the foreign shipments which had not been paying a proper duty.

Additional Duties Upheld—In a recent statement to the trade Mr. Bullock reported that the United States Court of Customs Appeals had refused to grant a remission of additional duties imposed in lieu of penalty for undervaluation on a shipment of German wrapping paper. The paper was sold at $4.25 per 100 lb. but the invoice stated the home market value of the paper to be 46.05 gold marks per 100 kilos ($4.98 per 100 lb.), and the paper was held dutiable at this rate, which is higher than the actual sale price. The importer had asked remission of additional duties on the assertion that there was no intent to defraud the revenue of the United States. But the Court of Appeals sustained the lower court in deciding that the importing firm had not discharged the burden resting upon it of establishing good

faith and honesty of purpose. The lower court had pointed out that there was no explanation of the fact that the invoice price was 30 per cent below the home market value as stated on the invoice itself.

No Drawback on Foreign Envelopes—The Treasury Department has revoked a ruling by which drawback will be allowed to an important New York magazine publishing company on plain white and plain manila envelopes imported to be addressed in this country. The original ruling allowed this company to import envelopes, address them in this country, and then secure a drawback of the duty paid upon re-exportation of the addressed envelopes. The Treasury Department now holds that such addressing is not a process of manufacture that would permit the granting of the drawback under the Tariff laws. The publishing company will therefore either have to pay duty on these envelopes or make its envelope purchases of domestic mills.

9-Point Straw Ruling Sustained—Prominent paper manufacturers were witnesses Wednesday, June 20, in the United States Customs Court at New York in the case involving an effort of importers to overthrow a Treasury Department ruling that 9-point straw for use in the manufacture of corrugated board is dutiable as paper at 30 per cent, and not as board at 10 per cent as claimed by the importers.

The importers' side of the case was presented in May, and the government closed its case at the June hearing.

The government's witnesses testified that straw paper such as is used in the manufacture of corrugated board is a development of the old butchers straw wrapping paper, and that it is commonly known as paper.

Among the witnesses were J. P. Brunt, of Chicago, vice president of the Container Corporation of America; Sidney Frohman, of Sandusky, O., president of the Hinde & Dauch Paper company; W. W. Galloway, of Cedarville, O., general manager of the Hagar Strawboard and Paper Company; N. H. Carpenter, of Coshocton, O., general manager of the Coshocton Straw Paper Company, and Sidney Mitchell, of New York, president of the United Paperboard Company.

The testimony went into great detail as to manufacture and sales practices. The case was regarded by the government as so important that Charles D. Lawrence, assistant attorney general of the United States in charge of customs, participated in the presentation of the government's case. Peter A. Abeles of the attorney general's office was in charge for the government.

The Import Committee of the American Paper Industry played an important part in the case, beginning with the successful efforts to convince the Treasury Department that the old practice of calling this commodity board was incorrect. After this ruling became effective the importers endeavored to overthrow the ruling by the court action now concluded.

The Import Committee was responsible for securing the government's witnesses, and assistance was rendered the government in the preparation and trial of the case by Carl E. Whitney of its counsel, John R. Hecht, customs expert, and Warren B. Bullock, manager.

Seldom in United States Customs Court cases has there been such an array of prominent business men to testify for the government on behalf of a domestic industry and the ability to assist the government in this manner is one of the strong appeals which the work of the committee makes to governmental authorities.

New Secretary for Woodlands Section

Charles W. Boyce, formerly of the United States Forest Service has been appointed secretary of the Woodlands Section of the American Paper and Pulp Association and will devote some of his time to assisting Major Porter in the general work of the association. Mr. Boyce studied forestry at the University of Michigan, from which he was graduated in 1914. He is known to the paper industry through his former connection with the United States Forest Service, being one of the authors of U. S. Department of Agriculture Bulletin 1241 entitled "How the United States Can Meet its Present and Future Pulpwood Requirements."

At the recent meeting of the Woodlands Section a representative advisory committee was appointed to formulate an effective program to assist the pulp and paper industry in handling its forestry and woods operation problems. This program is now being developed and will be presented to the advisory committee for approval at an early date.

Rules for Association Work

American Waxed Paper Association Meets with Trade Practice Division of Federal Trade Commission and Submits Body of Rules for Approval

A NEW note in association work, and particularly as regards paper industry associations, has been struck by the American Waxed Paper Association under the direction of R. B. Donnelley, president, and Paul S. Hanway, manager-treasurer. The eyes of the trade are now focused on this division which has initiated a move that may lead to the solution of questions which have been perplexing the industry for many years. Taking advantage of the desire of the Federal Trade Commission for open discussions of trade practices, a meeting with the Trade Practice Division of the commission was arranged in Washington last month, at which 80 per cent of the industry was represented, all of the important firms of waxed paper and vegetable parchment manufacturers sending spokesmen. Letters and telegrams favoring the conference had also been received from many manufacturers who were unable to attend.

The remarkable point about the proceeding was the initiative taken by manufacturers in appearing before the Federal Trade Commission to get that body's approval of a system of rules for the regulation of manufacture of paper as well as sales of the product to merchants and consumers of waxed paper, the object being to effect certain reforms calculated to improve conditions within the industry through the elimination of trade practices that might be deemed unfair or objectionable.

As is well known, it has not been the custom for the manufacturers of any commodity to approach the Federal Trade Commission for its approval in advance of rules governing production and sales. It has generally been the case that the Federal Trade Commission has demanded explanations of rules and practices followed by manufacturers, announced sometimes by a restraining order.

The American Waxed Paper Association was represented at the conference by legal counsel who explained that the trade conference was a part of the association's program for assuring stabilized conditions within the industry. The presiding officer at the conference was Commissioner G. W. Hunt who received the rules proposed for the government of the association after advising that the reception of such rules would not bar the presentation of additional rules or resolutions by other manufacturers outside of the association. Commissioner Hunt was assisted by Markham M. Flannery, who is the director of the Trade Practice Division of the Federal Trade Commission.

Before the rules were presented for adoption by Counsel Franklin D. Jones, Manager Hanway of the association made a statement explanatory of the aims and objects of the association. He said that the spirit of the conference as expressed by this industry was one of hearty co-operation with the Federal Trade Commission in the direction of eliminating unfair practices within the industry, and that the rules to be presented had been mailed to and discussed in great detail by representatives of the industry prior to the present conference. A set of fourteen rules to be followed by the association was then presented and read section by section to the conference before being offered for the approval of the Federal Trade Commission. The rules include methods of procedure governing contracts, deviations from standards, infringements of patents and trademarks, enticement of employees, price discrimination, selling below cost, etc.

After the presentation and discussion of the proposed rules, Commissioner Hunt congratulated the waxed paper manufacturers on the evident pains that had been taken by them to prepare a program for the conference. He said

that if the various industries in the country who sought conference from time to time with the commission would prepare programs in an equally business-like way it would conduce to a more satisfactory outcome for all concerned. His associate, Mr. Flannery, also paid gratifying testimony to the excellence of the preliminary work done on the conference by Manager Hanway and Counsel Jones, saying that such work had perhaps exceeded anything done by any previous conference and that it had been of exceptional assistance to the commission.

The rules of conduct and regulation of the industry which were adopted by the association and presented for final approval by the Federal Trade Commission are as follows:

Rule 1—Repudiation of Contracts: Contracts either written or oral are business obligations which should be performed in letter and in spirit. The repudiation of contracts by sellers on a rising market or by buyers on a declining market is equally reprehensible. Such action shatters confidence, induces violent fluctuations in price, destroys stability in business operations to the consequent injury of the industry as well as the general public and is an unfair trade practice.

Rule 2—Inducing Breach of Contract: Inducing or attempting to induce the breach of contract between a competitor and his customer during the term of such contract when the existence of such contract is known, is an unfair trade practice. Any person whenever notice of the existence of a contract is brought to his attention in any way shall promptly discontinue all efforts which might induce a contracting party to break such contract.

Rule 3—Ambiguous or Incomplete Contracts: The making of contracts which do not expressly cover specifications, time for delivery, inspection, filing of claims, and other items necessary to form a complete unambiguous contract often results in price discrimination, induces fraud, breach of contract and constant disputes, which create suspicion and ill feeling in the industry and is an unfair trade practice. It is the judgment of this conference that the industry should adopt in co-operation with buyers a standard form of contract which will avoid ambiguity, prevent misunderstanding, and thoroughly protect the rights of both buyers and sellers.

Rule 4—Deviation from Standards: Any deviation from the established standards of the industry causes confusion and waste, affords opportunity for discrimination and fraud and any such deviation unless the buyer is fully informed of the fact is an unfair trade practice.

Rule 5—The Imitation of Trademarks or Tradenames: The imitation of the trademark, tradename of a competitor results in the deception of buyers and consumers, is an invasion of the property rights of such competitor and is an unfair trade practice.

Rule 6—Enticement of Employees: Interference with a competitor's business through the enticement of employees from his employment is an unfair trade practice.

Rule 7—Defamation of Competitor or Disparagement of His Goods: The defamation of a competitor by words or acts imputing to him dishonorable conduct, inability to perform contracts, or questionable credit standing or the false disparagement of the grade or quality of his goods are unfair trade practices.

Rule 8—Threats of Suits for Patent or Trademark Infringement: The circularization of threats of suits for infringement of patent or trademark among customers of a competitor is an unfair trade practice. The owner of a patent or trademark should in fairness deal directly with the alleged original infringer rather than attempt to intimidate his customers.

Rule 9—Discrimination in Price by Means of Free Etchings or Plates: Furnishing, without direct charge based on actual cost, of etchings and plates, which vary greatly in cost and value, results in unfair, indirect discriminations in price between customers, which are in no sense made on account of differences in grade, quality or quantity and is an unfair trade practice. It is the judgment of this conference that a manufacturer should not supply etchings or plates either of new or modified designs, for less than the actual cost of such work or materials, as a separate, direct charge, all etchings and plates to be the property of the buyers and subject to his order.

Rule 10—Discrimination in Price by Means of Ink Coverage: The quotation of uniform prices by a manufacturer for printed waxed paper regardless of the ink coverage, which varies greatly in cost and value, results in unfair, indirect discrimination in price between customers which are in no sense made on account of differences in grade, quality or quantity, and is an unfair trade practice. It is the judgment of this conference that the industry should adopt a reasonable classification of ink coverage and that a manufacturer of printed waxed paper should make differentials in his price, based on the actual differences in his costs resulting from such different coverages of ink.

Rule 11—Use of Inferior Materials: The use of wax which is not fully refined, tasteless, odorless, and of the proper melting point for the purpose for which used, or the use of any inferior material which tends to bring waxed paper into disrepute or to defraud the buyer or the public is an unfair trade practice.

Rule 12—Discrimination in Price by Means of Split Shipments: The practice of accepting orders in large quantities for manufacture and shipment in small quantities (known as split shipments) at prices which do not provide for the increased cost of manufacture in such small quantities results in unfair discriminations in price between customers, in practical effect giving quantity prices on small deliveries to favored buyers which are not justified by any reduction in costs to manufacturer because of quantity or any difference in grade or quality and is an unfair trade practice. It is the judgment of this conference that the manufacturer of waxed paper who accepts quantity orders for split shipments should make a differential in price equal to his actual increased costs of manufacture on each split shipment in fixing his sales price.

Rule 13—Selling Goods Below Cost: The selling of goods below cost except to meet a price offered by a competitor is an unfair trade practice. Such a practice eliminates competition regardless of its efficiency, results in great loss to the industry, encourages price discriminations which may effect other industries and is an unfair trade practice. It is the judgment of this conference that every manufacturer of waxed paper should install a cost system which will enable him to determine accurately his costs.

Rule 14—Delivery Points: The practice of making sales on a f.o.b. mill basis has been long established as a custom in the industry. Much confusion has arisen in the industry causing unfair competition as a result of members of the industry selling their merchandise on a basis of free delivery in some instances and in others selling the same f.o.b. mill. Such a practice causes price discrimination, results in the granting of discounts on transportation charges, upon which the seller himself receives no discount and destroys the basis upon which competition can fairly and openly function.

The firms represented at the conference and their spokesmen were as follows: American Bread Wrapper Company, Emile Frisch and J. T. O'Rourke; Central Waxed Paper Company, R. B. Donnelley; Coated Paper Products Company, A. F. Gluck; Hamersley Manufacturing Company, J. D. Goldberg; Kalamazoo Vegetable Parchment Company, R. A. Hayward; Kuhmarker Manufacturing Company, D. Kuhmarker; Menasha Printing & Carton Company, E. A. Meyer and G. H. Gardner; Nashua Gummed & Coated Paper Company, W. L. Carter and E. A. Clark; Newark Paraffine & Parchment Paper Company, William J. Eishner and S. J. Eisner; Otsego Waxed Paper ompany, Karl Zimmer; Package Paper Company, Arthur Havemeyer; Paterson Parchment Paper Company, Charles H. Cashmore; Saniwax Paper Company, F. D. Bullock; Shawmut Waxed Paper Company, A. W. Moore; Southern Waxed Paper Company, R. B. Donnelley; Sterling Waxed Paper Company, S. G. Spiess; Union Waxed Tissue Paper Company, Russell A. Buhrer; Warren Manufacturing Company, B. H. Ballard; Waterproof Paper & Board Company, C. R. Wright; Waxhide Paper Company, E. L. Berkley; Waxed Products Company, Inc., E. A. Gould.

WISCONSIN NEWS

Nekoosa-Edwards Announces New Bond Issue

In order to retire a six per cent bond issue and avail itself of the lower money rates, the Nekoosa-Edwards Paper Company, with mills at Nekoosa and Port Edwards, Wis., has announced an issue of five per cent mortgage bonds totalling $3,500,000. A banking syndicate consisting of the following purchased the issue and will offer it on the market: Illinois Merchants Trust Co., Chicago; First Wisconsin Co., Milwaukee; Central Wisconsin Trust Co., Madison; Wood County National Bank, Wisconsin Rapids, and the First Trust and Savings Bank, Chicago.

A previous issue of $1,400,000 of six per cent bonds will be retired out of part of the proceeds of the new financing. The remainder will be used to pay for extensive new construction and improvement of the company's plants. The new bonds will constitute the only funded debt and will be secured by fixed assets of more than $12,000,000.

Has Process for De-inking

In merger recently announced, the Vera Chemical Co., of North Milwaukee, Wis., becomes a part of the $8,000,000 Paper Makers Chemical Corp. Several factory buildings and six and one-half acres of land are included in the transfer. The Vera company was capitalized at $500,000 and produced rosin size for paper mills in Wisconsin and Minnesota in addition to soap and soda products.

Is believed that this step will provide better research facilities for all the plants combined, as well as promoting more efficient service. Other companies included in the Paper Makers Chemical Corporation are: Adirondack Mineral Co., Western Paper Makers Chemical Co., John Regnier & Son Co., Superior Sizing Co., Keystone Products Co. This new concern also controls and manages the Georgia-Louisiana Corporation, the Superior Pine Products Co., the Empire Size and Chemical Corp., and the Vera Chemical Company of Canada, Ltd. Factory locations are at North Milwaukee, Wis., Fargo, Ga., East Fargo, Pa., Lockport, N. Y., Carthage, N. Y., Albany, N. Y., Marrero, La., Atlanta, Ga., Savannah, Ga., Jacksonville, and Pensacola, Fla., Stoneham, Mass., Boston and Holyoke, Mass., Comstock and Kalamazoo, Mich. The Superior Pine Products Company has 200,000 acres of pine forests which will be used to advantage as a source of supply.

Holders of common stock in the Northern Paper Mills, of Green Bay, Wis., received a dividend of fifty cents a share on July 1st. This is the second dividend since reorganization of the company and is understood to reflect gradual advancement towards a money-making basis. On Jan. 1, 1927, the company was able to pay its first dividend.

Out of 172,975 acres of land for which application is being made for reforestation under the new Wisconsin law, 31,360 acres represents what paper mills are doing themselves to bring about a renewal of the pulpwood supply for the future. Statistics compiled from the applications show that 66 corporations and individuals desire to have their lands set aside for tree growing, thus exempting them from taxes until the timber is cut. The Nekoosa-Edwards Paper Co. is entering 29,000 acres in Ashland County, and 1,000 acres in Wood County. Another tract of 1,360 acres in Lincoln County will be planted by the Tomahawk Kraft Paper Co. The Northern Wisconsin Realty Co. has entered 49,520 acres and the remainder represents largely the holdings of lumber companies.

Committee to Investigate One Day Rest Law

At a meeting June 26 at Wisconsin Rapids, Wis., a newly created advisory committee held a meeting to arrange for an investigation of the "one-rest-day-in-seven" law, A permanent organization was formed with Walter Mead, of the Consolidated Water Power and Paper Co., as chairman, and S. F. Shattuck, secretary of the Kimberly-Clark Co., as secretary. Other members of the board are: Manufacturers representatives, D. C. Everest, of the Marathon Paper Mills Co., W. J. Peacock, of the Northern Paper Mills, Franz Rosebush, of the Nekoosa-Edwards Paper Co., J. H. Miller, of the Whiting-Plover Paper Co., and W. F. Asche, of the Thilmany Pulp and Paper Co. Labor representatives are: Raymond Richards, W. J. Bell and Dan Hobbs, of Wisconsin Rapids, and Rasmus Anderson, president of the Pulp Workers Union.

About a year ago this Wisconsin law was enforced for the first time, after the Wisconsin Industrial Commission had been given authority to modify it if necessary. The purpose was to give every employee of paper mills and other industries one complete rest day a week. The Commission now desires to learn how the enforcement of the law is progressing and appointed the advisory committee so there could be co-operation to prevent hardships. Fred M. Wilcox and O. A. Fried represented the Commission. It is believed that the law is working out satisfactorily, but facts are to be obtained from all the mills.

Wisconsin again will have extensive training courses this fall in pulp and paper making and in foremanship and safety. The vocational schools are preparing for a large enrollment. Some changes and improvements will be made in the courses, according to H. G. Noyes, state director of paper and pulp instruction. By means of close contact with the mills, he has been able to obtain suggestions for training that will be the most valuable. Cities included for the courses will be Appleton, Neenah, Menasha, Green Bay, Marinette, Kaukauna, Wisconsin Rapids, Stevens Point, Mosinee, Wausau, Tomahawk, Rhinelander and Eau Claire.

The Park mill of the Marinette and Menominee Paper Co., located at Marinette, Wis., had its safety record ruined with a fatal accident late in June. A blow on the back of the head caused the death several hours later of Fred Parthie. He was putting up a belt in the beater room, and dropped suddenly to the floor. A supposed stroke of apoplexy was found to be a deep gash, the exact cause of which nobody witnessed.

Has Process for De-inking

De-inking of newspapers has become the subject of renewed discussion at Ashland, Wis., where William Hamilton claims to have a process that does the task efficiently at a very low cost.

Mr. Hamilton located an old recipe used by his father in the old country for removing ink stains from clothes. It was tried out on a small quantity of newspapers, and they were reported to be entirely clean and in good shape for making print paper. The cost of the materials for the de-inking was about two cents. Several mills are looking over his plans.

Chippewa Falls Power Plant Operating

Four of the generators have been put into operation at the Chippewa Falls plant which is just being completed by the Northern States Power Co. at Chippewa Falls, Wis. Two more generators are being erected and soon will be put into operation also.

The new dam supplying water power to these generators is 1,030 feet long. The power house in connection is 318 feet long and 57 feet wide. This plant furnishes 30,000 h.p., and with two others recently finished by the Northern States company, brings the total horse power to 100,000. The Wissota dam and power plant furnished 40,000, and the Jim Falls dam 20,000. The latter two are located near Chippewa Falls on the Chippewa river.

New and larger quarters are enjoyed by the Nekoosa Iron Works and Motor and Machine Co. of Nekoosa, Wis., since completion of a tow story building. More adequate equipment has been installed so that machinery up to ten tons can be handled efficiently. The company is pushing manu-

facture of the Nekoosa giant bark press, designed by M. J. Powers, the proprietor. Thirty of these have been sold thus far. The machine salvages the bark formerly dumped out by paper mills, and makes it usable as fuel by pressing it into compact form for handling the same as wood. One hundred cords of wood will produce $75 worth of this fuel.

Considerable damage was done to the refining department of the Menasha Printing and Carton Company, of Menasha, Wis., by a fire early in June. The fire originated in tanks of paraffin and raged for some time until chemicals could be brought from another city that would subdue it. The operation of the remainder of the company's big plant was not interrupted. The interior of the refining building was ruined and most of the roof was burned off. Although Theodore Yaley, refinery superintendent, was overcome with smoke, he recovered quickly.

D. C. Everest, general manager of the Marathon Paper Mills Company, is heading the organization which is arranging for the fall meeting of the Technical Association of the Pulp and Paper Industry at Wausau, Wis., on Sept. 25, 26 and 27. Choice of Wausau will mean a large attendance, it is believed. Committees are being appointed to work out the details of entertainment.

Because he donated the new $300,000 gymnasium to Lawrence College, of Appleton, Wis., L. M. Alexander had the privilege of turning the first spade of earth at the ceremonies inaugurating construction work on the new building. Mr. Alexander is president of the board of trustees of the college, and has made several gifts to the institution. He is president of the Nekoosa-Edwards Paper Co., of Port Edwards, Wis.

The Fox River Paper Co., of Appleton, Wis., soon will have a new boiler house at its main mill costing $30,000. Foundations are completed and the smokestack, of brick, has reached a height of fifty feet.

Aldo Leopold, associate director of the United States Forest Products Laboratory, Madison, Wis., has resigned after service there since 1924. He has entered private business as a consulting forester and will specialize in game preservation. He expects to start work immediately on a survey for the Sporting Arms and Ammunition Manufacturers Institute, to determine the extent of American game resources.

Dr. Zon Praises Wisconsin Forestry Efforts

Forestry efforts in which paper manufacturers of Wisconsin have had a very active part are praised by Raphael Zon in his annual report. Mr. Zon is director of the Lake States Forest Experiment Station, located at St. Paul, Minn. Pointing to the registry of more than 65,000 acres of lands for tree growing up to the time of the report, he declares this as proof that the Wisconsin forest tax law has more vitality than those of Minnesota and Michigan.

Wisconsin's forest nursery, says Mr. Zon, will be increased in capacity until it will furnish 20,000,000 plants five years from now. The output already has been doubled to take care of the demand. With regard to fire protection, he declares that 8,575,000 so guarded now is not enough and that twice this amount should be under supervision. Fires are decreasing in losses, however, so that the average number of acres burned over is 59 acres to each fire.

Frank Alanson, employed for forty years at the George A. Whiting Paper Co., of Menasha, Wis., died suddenly last month. He was among the oldest employees.

Excavating has been completed by the Consolidated Water Power and Paper Co. for the additions to its main mill at Wisconsin Rapids, Wis. Work is expected to proceed rapidly on the new finishing room and other units which are part of the equipment or changing the mill from newsprint to ground wood book paper. Frequent rains have delayed the construction program considerably.

Carroll college, located at Waukesha, Wis., has been tendered a gift of $50,000 by S. F. Shattuck, secretary of the Kimberly-Clark Company, of Neenah, Wis. This money is to be added to the school's endowment. Mr. Shattuck is a member of the board of trustees.

In the final accounting of the etsate of the late John Strange, founder of the John Strange Paper Co., of Menasha, Wis., it is found that his estate exclusive of the real estate amounts to $218,663. He has set aside $25,000 for charity. The residue goes to his widow, Mrs. Mary M. Strange, and the children, Hugh M. and John Paul Strange, Mrs. Katherine Athearn and Mrs. Ethel McLaughlin.

Appointment of George Brabender, of Peshtigo, Wis., as research engineer of the Northwest Paper Co., of Cloquet, Minn., is announced. He has been engaged in research in the paper and pulp industry for some time during a fellowship at the University of Wisconsin.

NORTHERN NEW YORK NEWS

Bagley & Sewall Making Machine for Zellerbach

The Bagley & Sewall Co. of Watertown has closed a contract with the Crown-Zellerbach Corporation of San Francisco for a 248 inch kraft papermaking machine. The Crown-Zellerbach Corporation is a recent consolidation of the Williamette Paper Company with the Zellerbach interests.

The machine is of the latest design high speed type built especially for the manufacture of kraft paper. There will be 44 sixty-inch diameter paper dryers in addition to the proper number of felt dryers. The fourdrinier will be of the quick removable type, all details being of the latest and most approved design. The machine will have three suction rolls, the Bagley & Sewall calender reel, winder and slitter. The drives will be the sectional electric. Delivery will be made via the Panama canal.

A. P. W. Co.'s New Building Nearly Completed

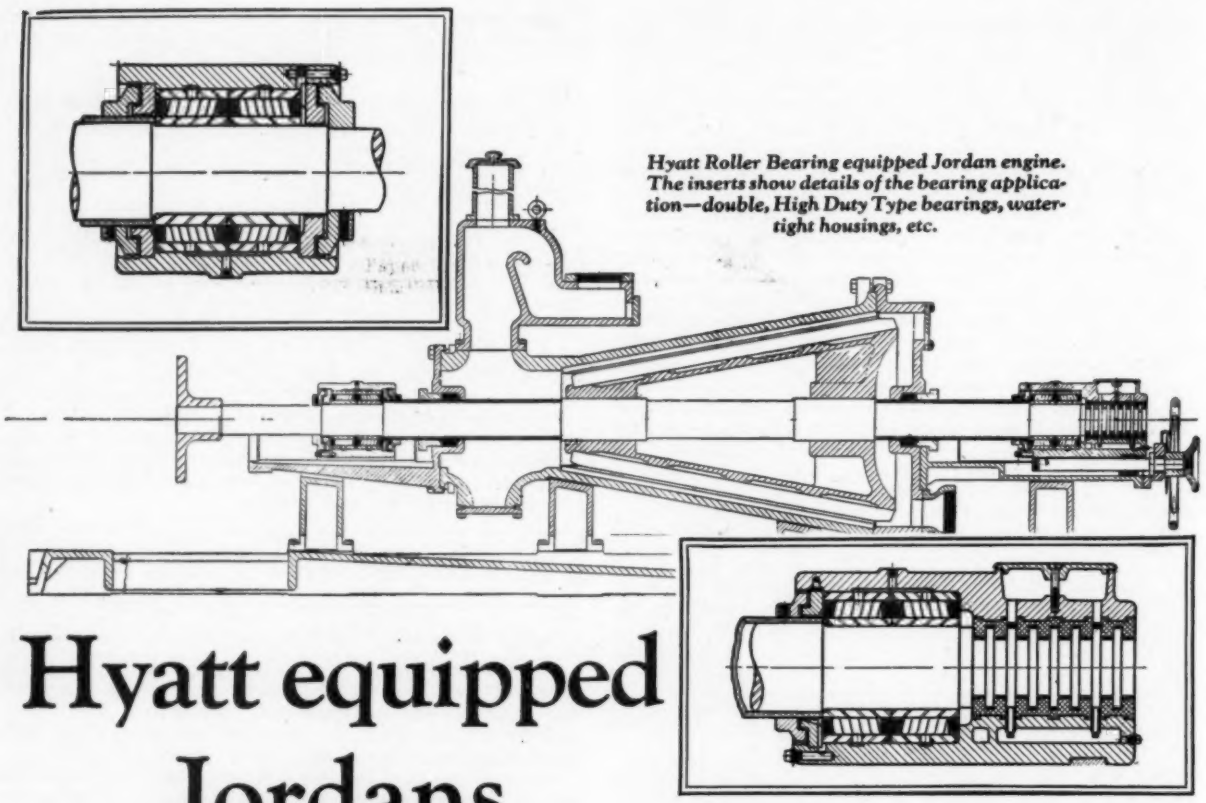
Output of the A. P. W. Paper Company's tissue mill at Albany, N. Y., will be increased substantially with occupation of the new machine room unit now being built by the H. K. Ferguson Company of Cleveland, which is expected to be completed early in September.

Erection of the structural frame of the building, which will contain more than 60,000 square feet, has been completed. The floor of the machine room is to be of reinforced concrete and the roof will be of timber construction with cork insulation to prevent condensation.

The weight of the entire structure will be supported by concrete piles, 400 of which were driven to an average depth of 30 feet. Permanent alignment of the big high-speed paper machine which will occupy this building thus will be assured.

The covered craneway for the pulp storage yard, which the Ferguson company built last winter, also is being extended 150 feet. This will greatly facilitate the handling of pulp unloaded directly from boats which bring it up the Hudson river and into the canal adjacent to the factory.

The Oswego Falls Corp., of Fulton has let the contract for the construction of a large steel, brick and concrete addition to the paper can department. The new building will enable the corporation to increase its production 33 per cent. The Oswego Falls Corporation in its can department makes a specialty of the manufacture of cylindrical paper containers for ice cream, cottage cheese and other uses and also makes milk bottle caps and containers largely used at ball parks, which can be used as megaphones after the pop corn which they contain is eaten.



Hyatt Roller Bearing equipped Jordan engine. The inserts show details of the bearing application—double, High Duty Type bearings, water-tight housings, etc.

Hyatt equipped Jordans produce uniform stock

BECAUSE correct plug alignment is assured at all times with Hyatt Roller Bearings, stock refinement is uniform. The dropping of the plug—prevalent with plain bearings—is eliminated.

This advantage adds to the life of the knives—there is equal wear at all points.

To all paper mill machinery Hyatt Roller Bearings bring that dependability which is needed for profitable, uninterrupted operation.

Economy of maintenance and worthwhile power savings also suggest that you investigate the advantage of Hyattized equipment.

Send for data on the application that interests you, or request that a Hyatt engineer call on you.

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HYATT

ROLLER BEARINGS

PRODUCT OF GENERAL MOTORS

Taggart Holding Company Formed

Interests connected with the F. L. Carlisle & Co. announce the organization of a holding corporation calied the Taggart Corporation with 100,000 shares of preferred stock, 100,000 shares of class A and 1,000,000 shares of common stock. The new corporation will control the Taggart Brothers, Inc., the Taggart Oswego Paper and Bag Corporation, the Champion Paper Corporation and the Carthage Power Corporation. These properties constitute one of the largest groups in the United States manufacturing kraft bag paper and multi-wall bags used in packing cement, flour, lime and other products.

Properties of the group consist of the four paper mills located at Oswego, Herrings and Carthage and three bag manufacturing plants located at Oswego, Herrings and Watertown. The annual capacity is 55,000 tons of kraft paper and 200,000,000 multi-wall bags. Officers and directors of the Taggart Corporation are F. L. Carlisle, president; B. B. Taggart and R. B. Maltby, vice president; R. K. Ferguson, secretary and treasurer; H. S. Sutton and T. F. Remington, assistant secretaries and W. H. Vervelt and W. C. Hull, Jr., assistant secretaries. Directors include Mr. Carlisle, Mr. Ferguson, H. E. Machold, C. E. Norris, and Delano Andrews.

Apprehension Over Canadian Price Cuts

Newsprint manufacturers in Northern New York are much concerned over the cut in prices which has been made by the Canadian manufacturers. They point out that newsprint consumption in the United States is increasing only about five per cent yearly.

Manufacurers of newsprint in Northern New York, whose equipment consists of large machines for the production of newsprint only, will have to turn to the manufacture of specialties, in the opinion of manufactures in this section. They make no attempt to minimize the seriousness of the situation and say that the price cuts are a part of a plan on the part of the Canadian manufacturers to get a monopoly. They point out that unless publishers in the United States are willing to pay a fair price for their newsprint, they will suffer, as the newsprint manufacture will be entirely removed to Canada. They lament the fact that paper enters this country duty free, but say that if this country placed a tariff on paper, Canada would immediately retaliate by placing an embargo on pulp wood.

The Taggart Oswego Bag and Paper Corporation is planning further expansion. A large storage warehouse on the lake front is the first step in the program. This is to be used for the storage of baled pulp and raw material. Owing to increased demands for production, it is impossible to store the material in the mill. The construction of a large addition to the bag factory is already under way.

Charles W. Valentine, president of the Bagley & Sewall Co., has been granted a patent on a flow evener roll for paper machines. The roll is made to fit the head box of the paper machine and has a rotable element for evening the liquids. The patent has been assigned to the Bagley & Sewall company.

Howard G. Shortt of Carthage, has been granted a patent for his invention of an automatic receiver pump for liquid storage tanks. One half interest in the invention has been assigned to the Stebbins Engineering and Manufacturing company of Watertown.

Archie Miles, 50, an employee of the Algonquin Paper Corp., suffered a fractured vertebra when struck by a falling lap of pulp.

C. W. Campbell of the Dexter Sulphite Pulp and Paper Company has been elected president of the Richville Limestone Co. Other officers are George W. Sisson, treasurer and general manager; John Schock of Newton Falls, secretary and Harry Gould of Lyons Falls, vice president. All are connected with the paper industry of Northern New York. The company produces limestone for paper mill consumption.

The scheduled parley to have been held in Washington last month between representatives of the newsprint manufacturers and the labor unions identified with the industry has been called off. It was the first meeting of the movement to bring about a five day week in the newsprint industry in the United States and Canada.

William D. Gregor, superintendent of the Newton Falls Paper company for the last six years has resigned his position. He is succeeded by Alfred Bryant of Kalamazoo, Mich.

Twenty boat loads of peeled pulp wood are expected to arrive at the Ogdensburg terminal for use of the International mill at Pyrites. The wood comes from lower Canada. The Algonquin mill will consume 70,000 cords this year, all of which will come from Canada by boat.

The International mill at Pyrites made a record for daily production June 8 when the four producing machines turned out 154.12 tons of Rangeley paper.

The entire group of officers of the Brownville Paper Co. has been re-elected as follows: president, S. A. Upham; vice president, R. L. Pease; secretary and treasurer, George F. Clark; assistant secretary and treasurer, J. H. Lingenfelter.

Paper manufacturers in Northern New York will ask permission of the authorities of Cape Vincent to build a sixty foot dock to be used as a wood and pulp terminal.

George H. Murphy, aged 59, a well known paper mill man of Northern New York, died at his home in Watertown June 15. He was superintendent of a fiber board and pulp mill in Covington, Va., a foreman in one of the Brownville board mills and superintendent of a fiber board mill in Rumford, Maine.

NEW YORK CITY NEWS

International Buys Southern Co.

Acquisition of the Southern Paper Company at Moss Point, Miss., by the International Paper Company was made known in an announcement issued from the headquarters of the latter company in New York on June 14. It was reported that the price paid for the company was $4,238,400 in 7 per cent preferred stock of the International Paper Company, for which all assets and properties have been acquired. Directors of the International issued additional preferred stock, which brings the outstanding issue of the International Paper Company preferred stock to $99,129,500. The I. P. Company also has acquired a newsprint mill of 170 tons daily capacity at Pyrites, N. Y., it was announced.

By acquiring the Southern Paper Company mill in Mississippi, the International now is said to be the largest producer of kraft paper in the world, its plants having a daily capacity of about 530 tons of kraft paper and board. The newly-acquired mill in Moss Point is of modern construction, located on tidewater in the southeastern corner of Mississippi, and is the fourth mill in the southern territory for the International Paper Company.

Joseph I. Grady

The paper trade in New York City was grieved to learn of the death of Joseph I. Grady, president and treasurer of Joseph I. Grady, Inc., paper and cardboard merchants of 31 Beekman street New York, and one of the oldest and best known paper merchants in this city which occurred on May 28 in his home at 236 East Seventeenth street, Brooklyn, N. Y.

Mr. Grady was an old New Yorker and was born in April,

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Economy is the keynote of this Size. And for papers made from unbleached pulps Kalbfleisch Wood Rosin Size gives results equal to the more expensive gum Rosin Size.

In connection with the consistently lower and more stable price of this size there is a further advantage. Kalbfleisch Wood Rosin Size assures satisfactory results through its uniformity and high sizing value.

These are tangible advantages which reduce the production cost of papers where absolute whiteness is not essential. Kalbfleisch Wood Rosin Size, through dependable quality, gives users these desirable results.

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ALUM (*both Commercial and Iron Free*)
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PLANTS

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1866, only a stone's throw from his place of business for many years. He spent all of his business career in the paper business, starting out as a salesman for the old firm of Searing, Tyrrell & Palmer, and later being with A. E. Crevier. In 1893 he established his own business, which was a success from the outset, and which was incorporated in 1905. A widow, two sons and a daughter survive. One son, Vincent I. Grady, is associated with Joseph I. Grady Inc.

Joseph Baldwin Seaman, formerly vice president of the Seaman Paper Company, of Chicago and New York, and long prominent in the paper trade, died suddenly on May 13 at the Hotel Briarcliff. He had gone from New York to the Westchester County resort on a golfing trip. Mr. Seaman was 45 years old, and a native of St. Joseph, Mo. At the time of his death he was connected with Henry Lindenmeyer & Sons, of New York, paper merchants. Mr. Seaman is survived by a widow, three brothers and two sisters.

Paper Box Makers in Convention

The tenth annual convention of the National Paper Box Manufacturers' Association, whose membership comprises most of the leading producers of paper boxes throughout the country, was held in New York City on May 23-25 at the Waldorf-Astoria Hotel, and was largely attended. Walter E. Trum, of E. J. Trum, Inc., Brooklyn, N. Y., was elected president of the organization for the ensuing year, succeeding A. G. Burry, of Fort Wayne, Ind.

Among the events of the convention were a tour through the Holland Vehicular Tunnel, a golf tournament, sightseeing trips, and a big dinner and vaudeville entertainment in the grand ballroom of the Waldorf. The delegates voted to hold their next convention in Chicago.

Dard Hunter has bought from Alfred B. Stone the buildings at Lime Rock, Conn., which for almost a century were operated as Iron foundries by the Barnum & Richardson Company. Mr. Hunter is said to be the only purchaser of hand-made paper in the United States. He plans to use the plant he has acquired for the making of individual stationery, employing European artisans. The mill is on the Salmon Fell Kill.

Herbert P. Brock, connected with the E. A. Stone Company, Inc., of New York, importers of papermaking rags, and one of the most widely known men handling rags for paper mills, died in the General Hospital in Philadelphia on June 13 following a short illness of pneumonia. Mr. Brock was about 47 years of age, and had spent many years in the rag business and was known to a great many paper manufacturers throughout the country. A widow and two children survive him.

The St. Regis Paper Company, of Watertown, N. Y., has moved its New York City offices to the new building of the Equitable Trust Company at 15 Broad street, where the new telephone number is Hanover 0930.

The Arcturus Paper Corporation, of New York City, was incorporated under New York State laws a few days ago with a capital stock of $10,000. The new corporation is represented by J. A. Brady, of 551 Fifth avenue, New York.

The White Paper Company, dealer in paper, cardboard and specialties, is now located in new and larger quarters in the new President Monroe Building at 111 Crosby street, New York.

Within the course of one year the number of stockholders of the International Paper Company more than tripled, according to an announcement issued from the New York offices of the company. On December 31, 1927, the I. P. Company had a total of 25,790 stockholders, compared with 8,180 at the end of the preceding year, and 4,527 at the end of 1923, prior to the advent of the present management.

New Catalogues, Books and Publications

Benjamin Electric Manufacturing Co., Chicago—This company has issued a new bulletin in colors illustrating and describing Benjamin Industrial Signals, which are used for factory calls and signals, industrial fire alarms, police call systems, traffic warnings, etc. In addition to the material describing the signal systems, wiring diagrams and a guide to wire sizes are given.

Boiler Engineering Co., Newark, N. J.—"Which Do You Prefer?" is the title of a new bulletin which compares the well-known Turner Boiler Baffle Wall with the not so well known BECO Baffle Wall. Both baffles are built exclusively by this company.

Combustion Engineering Corporation, New York City—Catalogue U-3 covers the Lopulco Unit System for burning pulverized fuel. The various types of horizontal, vertical and tangential burners used with this system are described. There are a number of interesting application drawings, illustrations and figures.

Connersville Blower Co., Connersville, Ind.—Bulletin 17A describes this company's types SF and SFH blowers of medium and larger capacities on lower pressure service, such as that for large heat treating furnace installations, foundry cupolas, water gas sets, etc.

Dayton Beater & Hoist Co., Dayton, O.—This company has just issued Bulletin 24 giving up-to-the-minute facts concerning the Dayton High Speed Beater for paper mills. Illustrations are given to show their method of rebuilding old type Holland beaters into Dayton High Speed type. This is further brought out with a diagram representing an average of test data on three different kinds of stock, between the Dayton High Speed and old type of beater.

Farnsworth Company, Conshohocken, Pa.—"Thermodynamics Applied to Paper Drying" is the title of a catalogue just issued by this company. There is much valuable information on the subject of paper drying, also illustrations, figures and diagrams.

E. F. Houghton & Co., Philadelphia, Pa.—"Lubrication for Safety and Economy" is the title of a booklet which describes this company's Absorbed Oils and the Gun-Fil Lubricator. The booklet is illustrated and gives details essential to economy in lubrication.

Ingersoll-Rand Co., New York City—The Cameron line of multi-stage centrifugal pumps is featured in a new catalogue just out. Specifications of the different types are given and there is a double page sectional view of the Class BMT Six Stage Pump. A large number of illustrations in colors enhance the appearance of this catalogue.

International Paper Monthly, International Paper Co., New York City—The June issue of this publication contains many interesting articles and illustrations. There is a four-page illustrated article on "Forestry in the American Expeditionary Forces" by L. R. Lohr, Captain, Corps of Engineers, United States Army and editor of "The Military Engineer;" an article entitled "Fire—The Great Enemy" by Hon. W. F. Finlayson, Minister of Land and Forests of the province of Ontario; an account of the inspection of the new office building of Lowell Electric Light Co. in Lowell, Mass., with exterior and interior views of the structure; and an illustrated article by J. D. Black, director, Bureau of Provincial Information and Tourist Travel, Province of Brunswick, on how to reach by automobile the Grand Falls, N. Y. There are also views showing the progress of the construction work on the hydroelectric developments of the company at Grand Falls, N. B., and Kent's Falls, N. Y.

Link-Belt Co., Chicago—The company's general catalogue 500 is just out. This book contains 1088 pages and not only covers engineering data and list prices, the complete chain sprocket, power transmission, elevating and conveying and engineering divisions of the company's busness, but contains considerable data for which the engineer has use. In addition to being an unusual engineering catalogue, it is a text book of the conveying, elevating and chain transmission art.

Sullivan Machinery Co., New York City—Bulletin No. 83J sets forth the leading features and advantages of Sullivan Angle-Compound Power Driven Air Compressors. There are many figures and illustrations showing these machines in use.

BOOK REVIEWS

Forestry in Wisconsin—The entire proceedings of the Wisconsin Forestry Conference which was held at Milwaukee, March 28 and 29, 1928, under the auspices of the Chamber of Commerce of the U. S. and the Milwaukee Association of Commerce, have been published in attractive book form. The text is supplemented by numerous illustrations of tracts of timber throughout the State, paper mills and oher allied manufacturing industries. The Appendix contains Wisconsin Forestry Laws and a chapter on the Valuation of Timber Crops, which Gives Formulas for determining the value of growing timber crops. Copies may be obtained from H. L. Ashworth, 49 East Wells St., Milwaukee, Wis. Price $1.00.

Missisquoi Merchants Manual—Missisquoi Pulp and Paper Company, manufacturers of fine cardboards and specialties, Sheldon Springs, Vt., is sending out to merchant customers a useful book of reference descriptive of the organization, its manufacturing facilities, merchandising policy and mill program, including a classified section with particulars of stock lines of cardboard grades. It is notable that uniform standards for both weight and caliper thickness are established in seventeen grades of different furnishes for four distinct groups of cardboards.

Minton Vacuum Dryer—

—as built by us and now in successful operation on a 156 "Newsprint Machine."

When looking for increased capacity from your old machine or for economies, write us for information on the Minton Dryer.

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Canadian News

May Organize to Dispose of Canadian News Print

It is reported that an informal meeting of representatives of the news-print industry was held in Montreal lately, at which the matter of forming a new organization, with a view to controlling production and stabilizing prices, was discussed tentatively. The objective, it is said, is to get all the companies to link up in the new endeavor to avoid "disastrous" price cutting, the danger of which has been getting omnious.

The Canadian News Print Co., which handled the distribution of the output of several of the big companies, will continue its operations until the end of the present year, owing to existing contracts, but its usefulness as a price stabilizer is referred to as having completely disappeared.

It is believed that some of the independents have already been approached and are willing to consider the matter of a common sales organization if the undertaking is managed differently from the old one, against which charges were freely aimed.

It is generally conceded by those representing the news-print manufacturing industry that something will have to be done if the business is to be kept operating on a profit-making basis, strong political objections to the Province's raw materials being used at no profit having been indicated in Premier Taschereau's recent utterances at Quebec.

Owing to readjustment of pulp mill tonnage, the Fort Williams Paper Co., one of the units taken into the Abitibi merger, is temporarily closing down but the company is using a large percentage of the regular employees in the woods operations. The two Port Arthur paper mills are still continuing to operate.

Suit for Alleged Breach of Paper Contract

W. R. Hearst and the Newspaper and Magazine Paper Corp., a Hearst subsidiary, served notice last month through the office of Max D. Steuer, of New York, of a suit for $24,740,000 damages against the following Canadian companies. Canadian Paper Sales, Ltd., $12,370,000; Abitibi Power and Paper Co., $3,950,000; Anglo-Canadian Pulp and Paper Mills, Ltd., $965,000; Brompton Pulp and Paper Co., $430,000; Fort Frances Pulp and Paper Co. and Kenora Paper Mills, Ltd., $2,100,000; Laurentide Co., $900,000; Port Alfred Pulp and Paper Corp., $900,000; Price Bros.; & Co., $1,435,000; St. Maurice Valley Corp., $1,815,000. As the defendants are foreign companies, in lieu of a summons and complaint, notice of the suit was served in the form of an attachment on T. T. Waller, described as vice-president of the Canadian News Print Co., of 420 Lexington Ave., which was said to be a part of the Canadian Paper Sales, Ltd.

A. F. McLeod, of Espanola, Ont., has been named to the position of organizer for the International Brotherhood of Paper Makers for Canada, succeeding Arthur Huggins, of Holyoke, Mass., who is now located in Albany, N. Y. The new organizer is the sixth vice-president of the Brotherhood, and is well known in both Canada and the United States. He is stationed in Three-Rivers and will be in charge of the Canadian branch of the international union, devoting the major part of his time in building up the membership of the Canadian locals and in organizing new ones.

In the death of Harry Judson Crowe, which took place recently in Toronto, one has passed away who played a leading part for years in the development of the pulp and timber trade in Newfoundland. It was largely through his efforts that the Anglo-Newfoundland Development Co. established its plant on the Island, and had it not been for Mr. Crowe's efforts, Lord Northcliffe and his company would not have gone there for their supply of pulp and paper. International Paper Co. was also introduced into Newfoundland by Mr. Crowe, who sold his property to the company.

The Bishopric and Lent Co., of Saskatchewan, has applied to the Advisory Board on Tariff and Taxation for the imposition of a duty of $6 per ton on sulphate of soda. The hearing, which was held in Ottawa a couple of weeks ago, was opposed by the Canadian Pulp and Paper Association, the Wayagamack Pulp and Paper Co., Bathurst Power and Paper Co., Dominion Paper Co., Pacific Mills, Ltd., Canada Power and Paper Corp., Canada Paper Co., Dryden Paper Co., and Brompton Pulp and Paper Co.

Canadian exports of pulp and paper in May were valued at $16,927,421, an increase of $4,526,952 over the total for the previous month and of $2,773,298 over the figures for May, 1927.

QUEBEC

Quebec Will Protect Present Paper Industries

The delegates to the 57th annual convention of the Canadian Manufacturers' Association, held in the first week of June, sailed down the St. Lawrence and up the Saguenay rivers, aboard the SS. St. Lawrence, and visited some of the tremendous power and industrial developments of the Saguenay and Lake St. John region.

The convention was addressed by Premier L. A. Taschereau, who stated that the Province, if necessary, will take steps to protect present paper industries and will discourage the establishment of new ones, as it was preferable to have one prosperous industry rather than two in difficulties. Paper industries, he warned, must agree among themselves. They must not, he urged, cut prices; they must agree among themselves; but in order to attain this end most satisfactorily, the co-operation of the Province of Ontario is required, so that the evils not wanted in Quebec may not find a resting place there.

Vote for Anticosti Wharf Reduced

The vote of $300,000 or improvements of navigation conditions at Ellis Bay, the chief port of the Island of Anticosti, action on which had been postponed when it first came up for consideration before the House of Commons at Ottawa, was finally passed after it had been reduced by $100,000. There was considerable opposition to this item on both occasions when it was considered, coming from members from various parts of the country, and particularly from Major C. G. Power, member for Quebec-South. It was contended that there was an utter absence of provision for human rights on the island, that Canadian citizens were obliged to ask for the privilege of access to it, and that there was no law or order on the island excepting such as was administered by the company.

In reply to these criticisms the supporters of the vote stated that the question of the citizen rights of the population was one largely for the Provincial Government; but it was felt that the Dominion Government should say to the Anticosti Corporation that it was expected these people should enjoy all the rights that British subjects are entitled to have. Moreover, the company has already spent $2,000,000 on wharf accommodation and development; the vote was for dredging, and the company could not dredge the St.

PRODUCTS

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Paper Machinery

Paper Making Machinery—all types
"Beloit" Removable Fourdriniers
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For utilizing surplus or off-peak power. Outstanding features are:

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Kaelin Electric Steam Generators have been built in capacities ranging from 100 K.W. to 42,000 K.W. at voltages from 550 to 13,200.

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Modernizing and re-building of all types of papermaking machinery to meet purchaser's requirements.

Roll Grinding

Dominion Engineering Works, Limited, operate a special department for the regrinding of rolls and cylinders. Capacity up to 12 feet diameter and 270 inch face.

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Lawrence River. The item was finally passed, as above mentioned, conditional upon the wharf being placed at the disposal of the public.

Wm. Hamilton, Ltd., Strengthens Board

At the semi-annual meeting of the board of directors of William Hamilton, Ltd., Kenneth T. Dawes, vice-president of National Breweries, Ltd., and director of the Title Guarantee and Trust Co., etc., who is well known in Montreal Business circles, was elected chairman of the board. Colonel John H. Price, president of Price Bros. & Co., and director of the Royal Bank of Canada, etc., was elected a member of the board.

Refiancing has been done, which puts the company in a proper position to carry on the large amount of business on hand and to handle far bigger contracts than in the past, made necessary by the increased volume of business and the new patents developed for the company by the president, P. P. Westbye.

In addition to its mining and hydraulic turbine equipment, Wm. Hamilton, Ltd., has produced and patented nine different types of equipmen during the past eighteen months, eight of which are already in successful operation in the pulp and paper industry.

This energetic and progressive organization has formed a number of sound connection for the purpose of manufacturing, under Canadian license, products which have been accepted as standard in other countries, notably their connections with the Mine and Smelter Supply Co., of Denver, Colorado; South-Western Engineering Corp., of Las Angeles, California, and the James Leffel Co., of Springfield, Ohio.

With reference to a newspaper report to the effect that he had disposed of his interest in the E. B. Eddy Co., Hon. R. B. Bennett, leader of the Conservative party, recently denied that any deal had been concluded, but stated that negotiations looking to this end were being carried on.

Opening of Another Canipco Plant

Another important factor in the industrial development of the Ottawa Valley was the opening, early last month, of International Fibre Board's new plant at Gatineau, to manufacture Ten Test insulating wall board. The largest and most modern plant of its kind in the world, this mill occupies over eight acres of floor space and has an ultimate production capacity of 600,000 square feet of board per day. The insulation of public buildings and homes is now recognized as a most important necessity, with the result that Ten-Test building board is not only in country-wide demand, but is largely sought for overseas markets.

Adjoining this mill is the large newsprint mill of the Canadian International Paper Co., of which International Fibre Board is a subsidiary. Screenings from the pulp mills are used in the manufacture of the Ten Test board, which in turn gives rise to wood flour as a by-product and this is used in the manufacture of dynamite, composition floors, and as an insulator in small openings.

The Donnacona Paper Co., which is controlled by Price Bros. & Co., is in no way affected by the withdrawal of the latter from the Canadian News Print Co. When Price Bros. obtained control of the company, it naturally took over the contracts which Donnacona had passed with different independent sales agencies. It is stated that the new administration has succeeded in reducing the cost of production quite appreciably, and that the company has sufficient orders on its books to enable it to operate at full capacity until the end of the present year. It should be noted that the company has a large working capital and has no indebtedness to the banks.

Edward Beck, secretary of the Canadian Pulp and Paper Association, has been given leave of absence to enjoy a holiday in England. He sailed with Mrs. Beck on the S. S. Duchess of Bedford on June 15th and expects to be absent about six weeks.

Royal Securities Acquires Rolland Paper Co.

Confirming reports which have been current in recent weeks, Royal Securities Corporation announced a few days ago the purchase of the plants, properties and business of the Rolland Paper Co., of Montreal.

The Rollands are the oldest writing paper manufacturers in Canada, their first mill having been established at St. Jérôme in 1882. Their business has been built up in the ensuing 46 years successfully by its original founder, the late Hon. J. B. Rolland, his sons, Mr. S. J. B. Rolland and the late Hon. J. D. Rolland, and his grandsons, including Jean, J. Pierre and Olivier Rolland, so that three generations of the same family have shared in the active direction of the business.

Rolland Paper Co. has been incorporated under Dominion laws to acquire as a going concern the plants, properties and undertakings of the old company of the same name, and public offering has been made of an issue of $1,500,000 6 per cent cumulative redeemable preferred stock of the new company. Outstanding capitalization of the company, in addition to the preferred shares, consists of $2,500,000 5.5 per cent first mortgage bonds and 60,000 shares of no par value common stock. The issue of preferred carried with it warrants entitling the holders to purchase common stock at the rate of three common shares for every ten preferred at $32 per share after June 1, 1929, up to and including June 1, 1930; at $35 per share thereafter up to and including June 1, 1932, and thereafter at $40 per share up to and including June 1, 1934.

Active management is to remain in the hands of the Rollands, who have been so successful in developing the business to its present proportions. S. J. B. Rolland is chairman of the new board; Jean Rolland, president; J. Pierre Rolland vice-president; and Olivier Rolland, general manager. Other directors include Archibald Fraser, president of Fraser Companies; Donald Fraser, vice-president of Fraser Companies; W. C. Pittfield, John H. Price and F. Saint-Pierre.

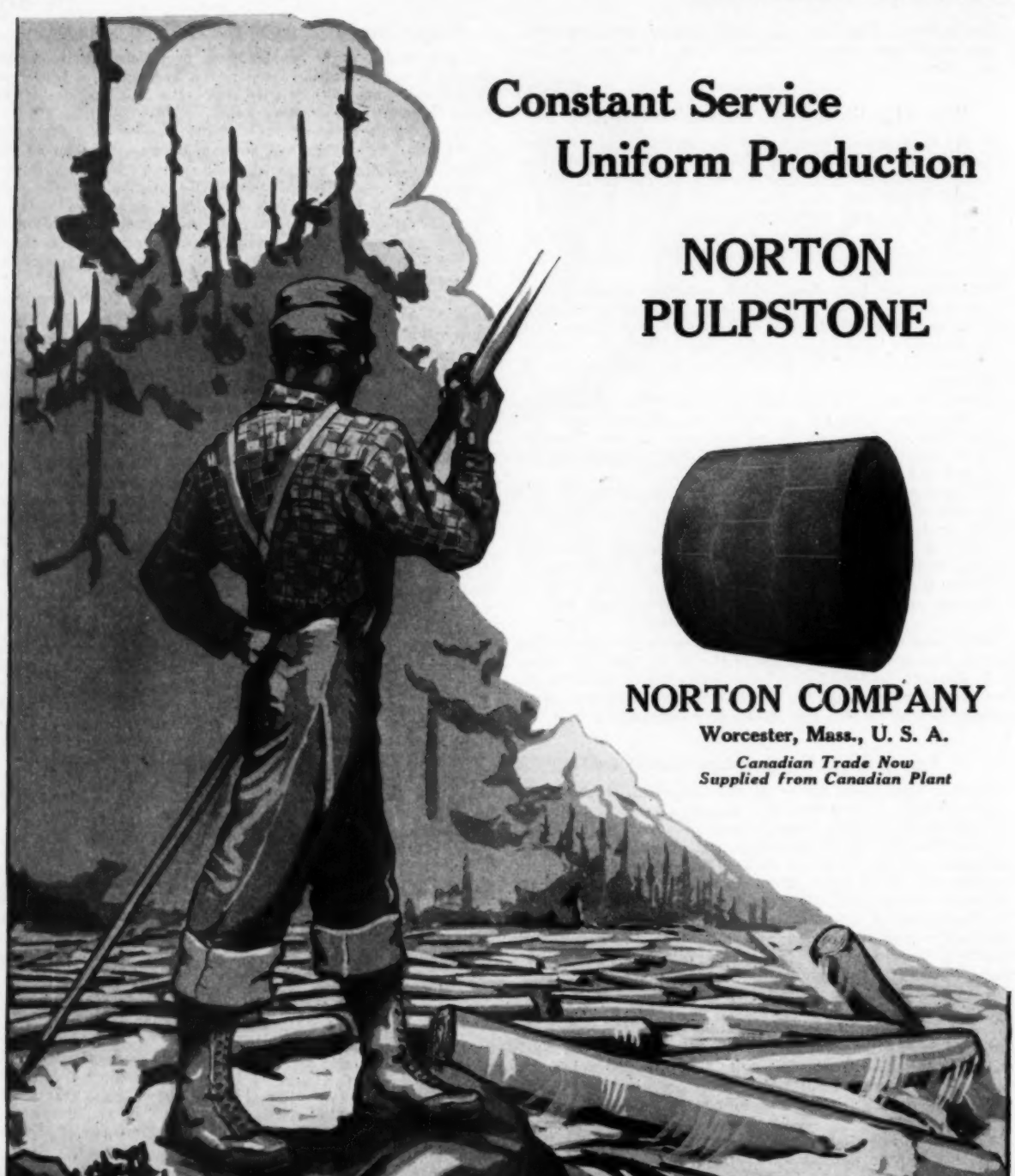
In addition to the St. Jérôme mill, which produces rag stock papers of the highest grade, the company owns a larger mill at Mont Rolland producing sulphite bond and rag stock papers. Excavation work has already been started on the extension necessary at the St. Jérôme mill for a new machine that is to be installed this year.

Doscher, Bendix and Co., large wood pulp importers of New York and Montreal, who acquired considerable wharfage in Montreal at the opening of the present navigation season, has already received at its Montreal warehouse about 7,000 of the 68,000 tons or so of Swedish pulp which it expects to import through Montreal this season. The pulp is transshipped at Montreal for consignment to the Central Freight Association territory in the United States.

C. R. Van de Carr recently severed his connection with the Ste. Anne Paper Co., one of the units absorbed into the Abitibi merger, to assume the position of manager for the Fraser Companies of New Brunswick. R. O. Sternberger will fill Mr. Van de Carr's position as manager of the Ste. Anne mill.

It is reported that the former shareholders of the Peninsula Lumber Co. have transferred all their interests to the Brown Corp. The property held by this company consisted of the seigniory of Grande Vallée des Monts, about 50 square miles in area, and about 100 square miles of Crown timber lands, all situated in the county of Gaspé. The Hon. W. Gerard Power, M. L. C., was president of the Peninsula Lumber Co.

During the recent floods in the Lake St. John and Saguenay districts, reports were circulated that Price Bros.' log boom at Riverbend, holding some five million logs, had given way, resulting in a serious loss of wood. Fortunately there was no truth to this rumor, the booms having withstood the tremendous strain to which they were subjected during the



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floods, which were due to exceptionally heavy snowfall during the winter combined with heavy rainfall in the spring.

Healthy Progress by Canadian Paperboard

A sound improvement, both in earnings for the year and in balance sheet position, is revealed by the Canadian Paperboard Co., Ltd., in its annual report for the fiscal period ended March 31, 1928. Sales and profits of the company show a satisfactory expansion, earnings on the outstanding common stock being up at 3.39 per cent as compared with only 0.78 per cent for the preceding year, while net working capital is up sharply, despite the fact that the new mill at Toronto has been under construction during the year under review.

In presenting the report to shareholders, president J. G. G. Kerry said in part: "The report makes one of the most satisfactory showings that we have yet had to present to you. The three mills of the company have been operated to capacity throughout the twelve months under review, and gross production has been 30,770 tons, as contrasted with 27,856 tons in the previous year. The mills have been more skilfully operated during the past year than at any other time in their history and this fact accounts for the satisfactory financial showing made in the face of very active trade competition. The most noteworthy undertaking of the company during the year has been the establishment of a new mill in Toronto. Construction on the new unit is now well advanced, and it is hoped to place it in operation during the month of August of this year."

At the auction held in Toronto on June 25th the properties and assets of the Franquelin Lumber and Pulpwood Co., Ltd., was acquired by the Ontario Paper Co. for the sum of $1,100,000. These assets consist of a 15,000-acre tract on the upper basin of the Sheldrake River (in the Saguenay District containing about 100,000 cords of pulpwood, cutting rights on a 125-square mile tract in the vicinity of the Franquelin River estimated to contain about 50,000 cords of pulpwood, a hydro-electric power plant and a pulpwood handling plant including breakwaters, conveyors, booms, jack ladder equipment, barker drum houses, etc.

A provincial charter has been granted to the Canadian Pulp and Paper Corp., with a capital stock of 28,400 shares of no par value. The amount of capital stock with which the company commences its operations will be $142,000. The company is empowered to carry on the business of lumber and the lumber trade in all its branches, as well as to deal in ties, poles and posts, and to manufacture and deal in pulpwood, paper and other products. The provisional directore are Arthur Fitzpatrick, William Amyot and Maurice Dupré, all of Quebec.

Good progress is being made in connection with the erection and equipment of the newsprint mill of the Murray Bay Paper Co., a subsidiary of the Abitibi Power and Paper Co. that was taken into the merger. This mill will have a capacity of about 125 tons of newsprint daily, or one-half that of the Manitoba Paper Co. and the Ste. Anne Paper Co., other subsidiaries now in operation. The mill is situated near Murray Bay, some 90 miles below the city of Quebec, and has as its basis an existing groundwood mill. The cost of the installation of a newsprint unit has been considerably lessened through this fact and also by reason of an agreement that will enable it to purchase its sulphite from the Ste. Anne Paper Co. instead of having to erect a special mill for the purpose. The latter mill is some 70 miles nearer Quebec City, but is readily accessible as both mills are situated on tidewater. There is an existing power plant and additional power required in the future will be supplied by the Shawinigan Water and Power Co.

With a view to improving the residential lots in the town and to grant the employees of the Bonaventure Pulp and Paper Co. an opportunity to advance its gardening operations, a Gardeners' Association has been formed at Chandler. The company has set apart lots from its vacant areas and prepred the land. These lots have all been taken up for vegetable cultivation. Already a very keen interest has been taken all round in the project, and it is the intention of the association to hold a horticultural display about September.

Another New Mill Projected

It is stated that the James Maclaren Co., Ltd., intend to build a paper mill and to develop its High Falls power. The paper mill will have two paper machines which, when operated at maximum capacity, will make 250 tons of newsprint a day.

The High Falls power is 23 miles north of Buckingham and will be developed under a 180-foot head. This site is capable of a development of 120,000 horsepower. It is proposed for the present to put in three power units, about 90,000 horsepower. This current will be used in the paper mill for power purposes and for drying the paper.

A storage dam will be built on the Lièvre River at the Cedars, a short distance above Notre Dame du Laus, which will hold back the water in the river and in Whitefish Lake, creating a reservoir which will hold in the neighborhood of thirty billion cubic feet of water, and will do much towards equalizing the flow of the river throughout the year.

Preliminary work in connection with these projects has been going on for some time, and while the location of the paper mill has not yet been definitely decided upon, it will be in Buckingham or vicinity. These projects will start some time this year, depending on how quickly the many preliminaries involved in connection with works of this extent can be cleared away.

The annual golf contest between the Canadian Paper Merchants and Manufacturers was held a couple of weeks ago and resulted in a win for the Merchants by a very close score. The trophy, presented by the Lincoln Pulp and Paper Co., therefore passes out of the custody of the paper mills, who won it last year when it was first put up for competition. Through the courtesy of Mr. C. Howard Smith, the tournament took place at the links of the Mount Bruno Country Club, and this beautiful course was greatly admired by all who took part. Perfect June weather added to the enjoyment of the occasion.

One of the subsidiaries of Abitibi Power and Paper Co., namely, Ste. Anne Paper Co., will not participate in the $4 dividend rate that went into effect on the new common stock of Abitibi on the first of January last, until July 1st of next year, a period of eighteen months after the company was considered as part of the merger organization, and the same period after this dividend rate was made applicable to the old shareholders of Abitibi and of Spanish River. At the same time, the earnings of Ste. Anne Paper Co. will accrue for Abitibi from the beginning of 1928.

ONTARIO

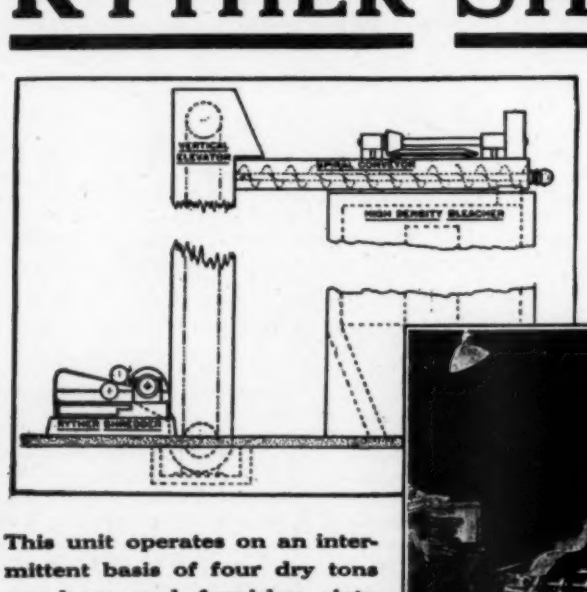
Transfer to Abitibi Approved

Despite the fact that lawyers acting for M. J. Chase and Co. filed affidavits opposing the merger with Abitibi Power and Paper Co., which will lead to litigation, Justice Middleton, at Osgoode Hall, Toronto, issued an order recently approving the sale or arrangement for the transfer of the whole business and property of the Spanish River Pulp and Paper Mills, Ltd., to the Abitibi Power and Paper Co., as provided for in an agreement between the two companies.

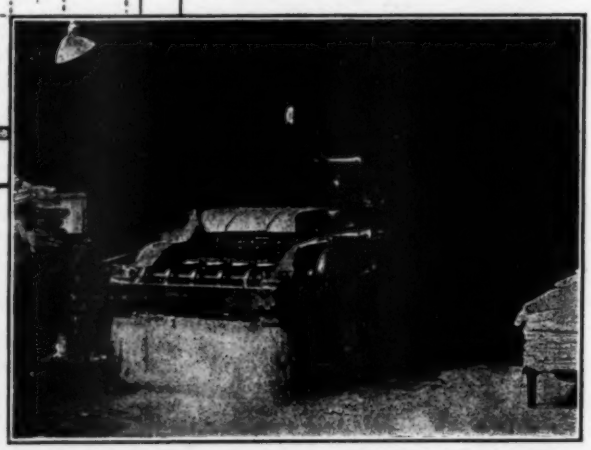
The agreement provides for the transfer of the entire property and assets of the Spanish River to the Abitibi company for a consideration of common and preferred shares of the Abitibi company, the payment by the latter of the mortgage bonds of the Spanish River and the Ontario Paper Co. at par and accrued interest, plus a premium of ten per cent, and the assumption by the Abitibi Co. of all other debts and liabilities of the Spanish River company. The

RYTHER AND PRINGLE COMPANY
CARTHAGE N.Y.

RYTHER SHREDDER



FURNISHES HIGH DENSITY BLEACHERS



This unit operates on an intermittent basis of four dry tons per hour and furnishes sixty dry tons of sheet and lap sulphite per day. The dryness of the stock is reduced to forty percent in the shredder by means of the standard shower delivering water at the tearing point. The shredded product is discharged by gravity into the boot of the elevator and conveyed to a horizontal screw conveyor located above the bleachers. The bleaching liquor is added at the elevator head and thoroughly mixed with the pulp in its passage through the worm. The dryness of the pulp when it reaches the bleacher can be accurately controlled.

FOR CANADA REFER

CANADIAN INGERSOLL-RAND COMPANY, LIMITED
10 PHILLIPS SQUARE, MONTREAL, P. Q.

amalgamation is the logical outcome of the offer made by the Abitibi company in October last to the common shareholders and which was accepted by 92 per cent of them. G. T. Clarkson is the liquidator of the Spanish River company.

Dominion Boxboards to Have Sandy Hill Machine

The Sandy Hill Iron and Brass Co., of Hudson Falls, N. Y., is building the new 7-cylinder machine to be installed in the plant which the Dominion Boxboards, Ltd., is erecting on Toronto Bay, 500 yards from the Eastern Gap leading into Lake Ontario. The machine will trim 102 inches and will be equipped with 114 48-inch dryers, three stacks of calenders, cutter and rewinder. The beater room will be 96 by 120 feet and the machine room 50 by 417 feet. The warehouse for finished paper will be 68 by 138 feet and two stories high. The company has not yet decided on a raw stock warehouse, having made arrangements to have its raw stock delivered daily. The basement in the beater room affords ample storage for the raw sulphite and groundwood. The paper machine will have a capacity of 100 tons of chip board daily, and 75 tons of patent coated or bleached manila lined chip.

The company will take its water by gravity from the bay and filter it, and will discharge the dirty water into the Cherry street trunk sewer which runs into the Toronto ship canal.

The site, which is about three-quarters of a mile from the present plants of the Dominion Boxboards, is approximately eight and a half acres in area, and the plant is being laid with a view to subsequently installing a second machine. All the activities of the company in Toronto are expected to be ultimately moved to the new site.

It is expected that about half the output of the plant will be used in the company's Toronto and western plants.

Hinde and Dauch Financing

Acquisition of additional properties, extensions and improvements of the Hinde and Dauch Paper Co., of Canada, is being financed through the sale of $1,500,000 5.5 per cent first mortgage bonds, which was offered to the public about a month ago.

The company, which has been in operation in Ontario for the past 18 years, is now the largest manufacturer in the Dominion of fiber shipping boxes and corrugated paper products, and is also the largest producer of straw paper for corrugating purposes.

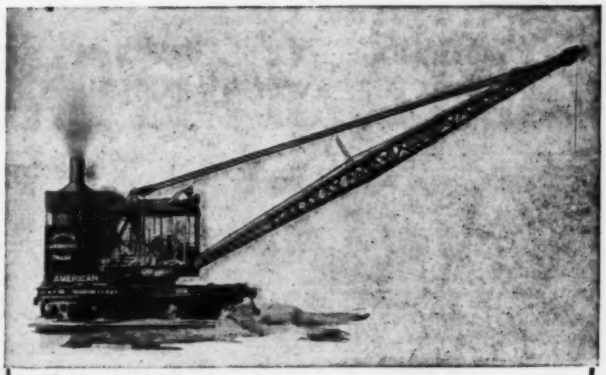
Offset Cartons, Ltd., Toronto, have installed a No. 1 L. & M. cutter and creaser machine with extension delivery and semi-automatic feeder. The unit was sold through British Printing Machinery, Ltd., Tortnto.

The Toronto Harbor Commissioners recently announced the completion of a deal with Kilgours, Ltd., paper bag and paper box manufacturers, for the sale to that firm of the southeast corner of Fleet and John streets. The lot is 200 by 133 feet, and on it will be erected a modern fireproof building of reinforced concrete, seven stories high and containing 140,000 square feet of floor area. The building will cost in the neighborhood of $250,000.

Production Starting at Kapuskasing

Spruce Falls Power and Paper Co.'s first newsprint machine at Kapuskasing as well as the first unit of the 74,000 h. p. plant at Smoky Falls, is now ready to come into operation. Work on the company's power and paper project in Northern Ontario has been proceeding faster than scheduled, and it is anticipated that the full capacity of the plant, namely 170,000 tons a year, will be reached before January next. The New York Times will consume about 110,000 tons and the remaining 60,000 will be sold in the open market.

The company has pulpwood rights on nearly 5,000 square miles of limits, estimated to contain 10,500,000 cords of pulpwood. The properties also include power sites at Kapus-



A High Speed Crane for Wood - Yard Service

The "AMERICAN JACKRABBIT" High Speed Locomotive Crane — steam operated — was designed especially for loading and switching service in large yards. It will pull a carload of timber at a speed of eight miles; 3 cars at 3 miles an hour. It is boilered to enable it to maintain this speed for long distances. Two of these cranes in use at the Texarkana plant of International Creosoting Co. have won high praise from the men in charge. The "AMERICAN JACKRABBIT" Crane has a rated capacity of 20 tons and is equipped with 50-foot boom with a swivelling block in the boom point.

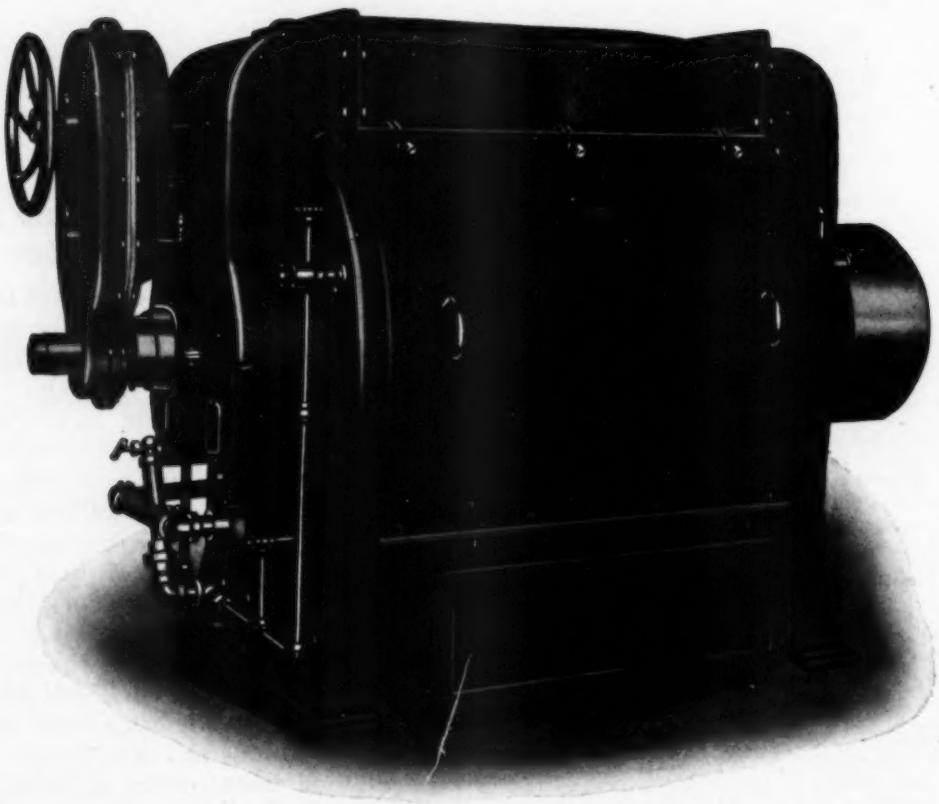
The high traveling speed of the "AMERICAN JACKRABBIT" Crane makes it of the greatest value for loading cars from all points in the yard. It is a money saver and a time saver; always dependable and "ready to go".

If a gasoline-operated crane is preferred we offer our Three Speed Crane with automotive gear shift. This modern crane can be geared up to do better than 8 miles an hour pulling a carload of timber.

AMERICAN HOIST & DERRICK CO.
Saint Paul, Minn.
New York, Chicago, Pittsburgh, St. Louis, New Orleans.

REED-SPAFFORD PULP SCREEN

(Built in two sizes)



The REED-SPAFFORD PULP SCREEN is remarkably efficient. Its capacity is large and its power consumption is surprisingly low. Let us show you what a saving this screen means to you.

Our Paper and Pulp Machinery is CONSTANTLY IMPROVED

Improved Paper Machinery Co.

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SHERBROOKE MACHINERY CO., Limited

Sherbrooke, Quebec, Canada

kasing and Smoky Falls on the Mattagami River. In addition to the newsprint mill, the company also has under construction sulphite and groundwood mills with rated capacities of 230 and 440 tons daily, respectively. In addition to the 200,000 shares of no-par-value common stock held by Kimberly-Clark and the New York Times, the issued capital of the company consistes of $6,500,000 first preferred and $5,000,000 second preferred stock.

Construction work has been started on a branch factory in Windor, for the London Shipping Containers, Ltd., of London, Ont. The plant will be one story and will represent a structural cost of $30,500. Operations are expected to start some time this month.

Box Factories Change Hands

A large business deal, involving between one and two million dollars, was closed last month in Toronto, whereby James Playfair, of Midland, has purchased the Canadian Wirebound boxes, Ltd., of Toronto and Montreal. A new company will take over the plant in both cities, which include the wirebound and corrugated paper and box factories on Notre Dame St., Montreal, and the wirebound box factory on Gerard St., Toronto. Real estate, plant equipment, goodwill, etc., are included in the deal, and the transfer of all the assets to the new company, which will be a stock proposition, will mean considerable future extensions to the business by the incorporation of new capital. Under the present plans it is proposed to build a new $40,000 plant in Toronto, which will include a wirebound box factory and a corrugated paper and box factory, while plans for the future will likely provide for the establishment of plants in all of the provinces of the Dominion.

A. J. Laplante, vice-president, and A. M. Dunn, general manager, will be actively connected with the new company.

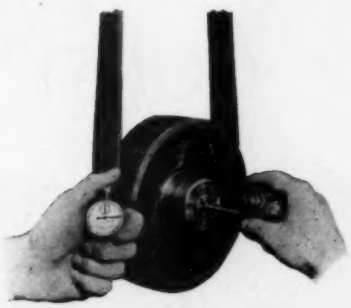
By supplementary letters patent, the capital stock of the Superior Paper Mills, Ltd., Thorold, has been increased from $250,000 to $500,000 by the creation of 2,500 shares of $100 par value.

A provincial charter has been granted to Westman Publications, Ltd., Toronto, publishers of "Canadian Chemistry & Metallurgy" and of the "Laundry and Dry Cleaning Journal," to carry on a general printing and publishing business. The authorized capital stock is $100,000. Among the incorporators are L. E. Westman and M. H. R. Sutherland, of Toronto.

Col. C. H. L. Jones, vice-president and manager of operations of the Spanish River Pulp and Paper Mills, Ltd., which was recently merged with the Abitibi Power and Paper Co., has severed his connection with the concern and has moved to Liverpool, N. S., where he has become associated with the new paper mill to be constructed there by the Killam interests. Col. Jones, who had been a resident of Sault Ste. Marie for almost thirty years, going there to take a place with the Clergue interests, was commander of the 227th Battalion C. E. F.

The Firstbrook Box Co., of Toronto, manufacturers of paper boxes, wooden boxes and corrugated board boxes, have decided to build a plant at Mount Dennis, a short distance out of Toronto, at a cost of $350,000. The company has purchased ten acres on the Tretheway estate and will erect two brick buildings in which will be employed about 350 men. Work is to be started in the very near future and the building will be completed before the end of the year. It has not been stated what proportion of the new plant will be devoted to the manufacture of paper boxes.

A. Curtis, first vice-president of Canadian International Paper Co., was in Fort William and Port Arthur last month. He said that they had sites to choose from in those cities for the establishment of their new paper mill, as well as at Nipigon, but nothing definite would be decided until a little later. It is stated that the plant will cost ten or twelve



Belt Testing

A—With a speed indicator take the r.p.m. of the driven pulley when the belt is not loaded.

B—Then take the r.p.m. when the belt is fully loaded.

Subtract B from A, multiply by 100, and divide by A and you have the percentage of power loss.

Example: A=1,000 r.p.m;
B=950 r.p.m.
1,000—950=50
50×100=5,000
5,000÷1,000=5% power loss.

Try it with oak leather, rubber, cotton or any other belting. Then try VIM Leather Belting.

You will find the power loss is less with VIM than with any other belt.

You will find that VIM pulls more than any other belt.

VIM is more elastic, stronger, tougher and lighter. It is waterproof — withstands higher temperatures without burning—is longer lived.

Our booklet, "The Belt that puts the Pull in the Pulley" can be had on request. Its true worth to belt users is inestimable.

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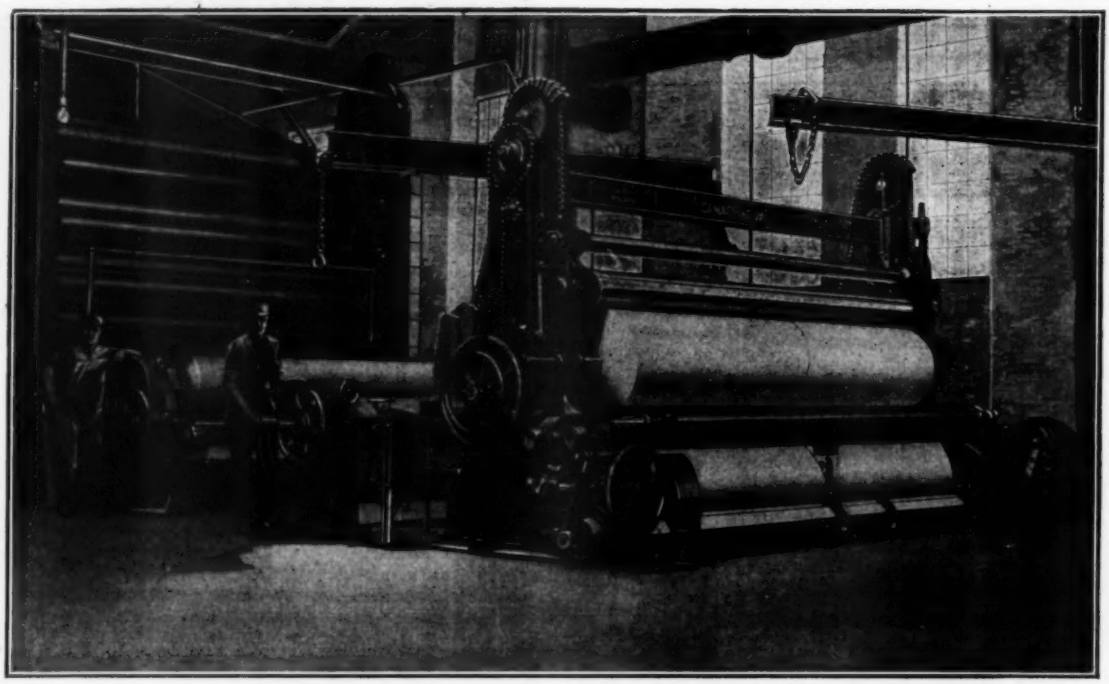
GOOD NEWS ROLLS



A news roll which will unwind at high speed clear down to the core is easy to sell.

Add to this the saving factors in both the mill and the press room, due to approximately 12% more weight per roll, 12% less cores and cargo space.

Camachines Make Such Rolls

CAMERON MACHINE COMPANY

61 Poplar Street Brooklyn, N. Y.

million dollars. Actual construction will not start until the coming fall. Those who accompanied Mr. Curtis on his visit to the head of the lakes were W. Hinman, superintendent of woodlands, and General Wood, one of the vice-presidents of Canadian International Paper Co.

The Ontario Department of Forestry has constructed eight new steel observation towers in the clay belt of Northern Ontario and each of them will overlook an area 20 miles in radius. In making the announcement, E. J. Zavitz, Deputy Minister of the Department, stated their erection means that the territory covered by the Spruce Falls and the Abitibi Power and Paper companies are now "tied in" with towers and telephones. Mr. Zavitz further stated that twenty more towers will be built throughout Ontario this year, and when these are completed approximately 25,000,000 acres of timber land will have been brought under observation.

The new wage and working agreements for the current year have been signed by J. R. Booth Co., of Ottawa, these being on the same basis as last year's agreements.

John T. Hornibrook, who for sixty-one years has been associated with Brown Bros., Ltd., wholesale paper dealers and blank book manufacturers, Toronto, recently celebrated his seventy-ninth birthday by going to the office as usual. He served in the Fenian Raid in 1866, and the following year entered the employ of the firm with which he is still connected as secretary and director.

J. E. Patterson has been appointed manager of operation of all the paper mills in the enlarged Abitibi company. Mr. Paterson is one of the oldest employees of the company. He went to Iroquois Falls on March 26, 1913, on the office staff, and when the mill cammenced operation organized the efficiency department. Later his hard work, energy and ability were recognized by his being appointed general superintendent of the mill in January 1922, and in August 1926 his services were again recognized by promotion to manager of the mill. Now he has mounted another rung of the ladder by the present appointment.

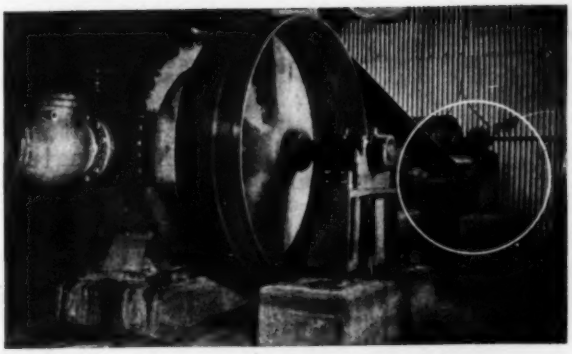
The new record for a single day's flying that has been set by an air pilot of the Provincial Forestry Patrol directs public attention to the splendid service being rendered Ontario by the Government air force. In one day a provincial air pilot put in thirteen hours and twenty-five minutes in the air, patrolling timber resources in the Pine Ridge district in Northern Ontario.

Ontario manufacturers of light weight papers were interested in an address on the ways of widening markets for the products of Canadian orchards at Convocation Hall, Toronto, by Sir William Hardy, world authority on refrigeration and cold storage. Sir William, who is director of the Low Temperature Station for Research in Biochemistry and Physics at Cambridge University, presented a popular account of improvements which are being introduced in the storage of foodstuffs as a result of recent scientific research, and he declared that the freer use of paraffined paper would add greatly to the conserving and preservation of the fruit.

Abitibi to Run Low-Cost Mills to Capacity

Owing to the unsatisfactory conditions in the newsprint industry and the necessary curtailment in production, it had been reported that the Iroquois Falls mills was going to be shut down for an indefinite period. L. R. Wilson, managing director of the Abitibi Power and Paper Co., has announced that, while the company had been forced to restrict production in some of the other mills to meet market conditions, the policy was to shut down the higher cost mills and operate to full extent the low cost ones, and under this arrangement it was the intention to keep the Iroquois Falls mill up to its maximum continuously.

The plant of the Fort William Paper Co., one of the Abitibi merger units, has already been closed down entirely for an



Note the smoothness of this LENIX vacuum pump drive. This LENIX is one of the ten installed in the Pine Bluff mill of the Manitoba Paper Co.

Smooth Belt Drives Are Belt Drives at Their Best

GIVE a belt drive proper tension and smoothness and you have just about the ideal drive.

These two essential requirements are provided by the LENIX Drive. Proper belt tension is constantly and automatically maintained; fluctuating loads are compensated for.

The result is

increased horsepower
prolonged belt life
reduced bearing pressure

.....which mean less cost for transmitting power.

Many paper mills are now using the LENIX on beater, vacuum pump and other drives. Many more mills could profitably follow their example.

Why not send in details of your belt drives and let us recommend the proper size LENIX units?

F. L. SMIDTH & COMPANY

Incorporated 1895 Engineers
225 Broadway, New York, N. Y.

The* LENIX *Drive

Trade Mark Reg.

Figures that speak for themselves!

According to a recent comparison of Nash installations with the paper mills listed in a recognized directory, Nash Hytor Vacuum Pumps are used in approximately 68% of the mills in the United States and Canada.

For the larger plants, the figures show Nash pumps in

Bulletins, describing Nash pumps, are available on request.

90% (approx.) of the U. S. mills producing 50 tons per day and over.

84% (approx.) of the U. S. mills producing 25 tons per day and over.

86% (approx.) of the Canadian mills producing 50 tons per day and over.

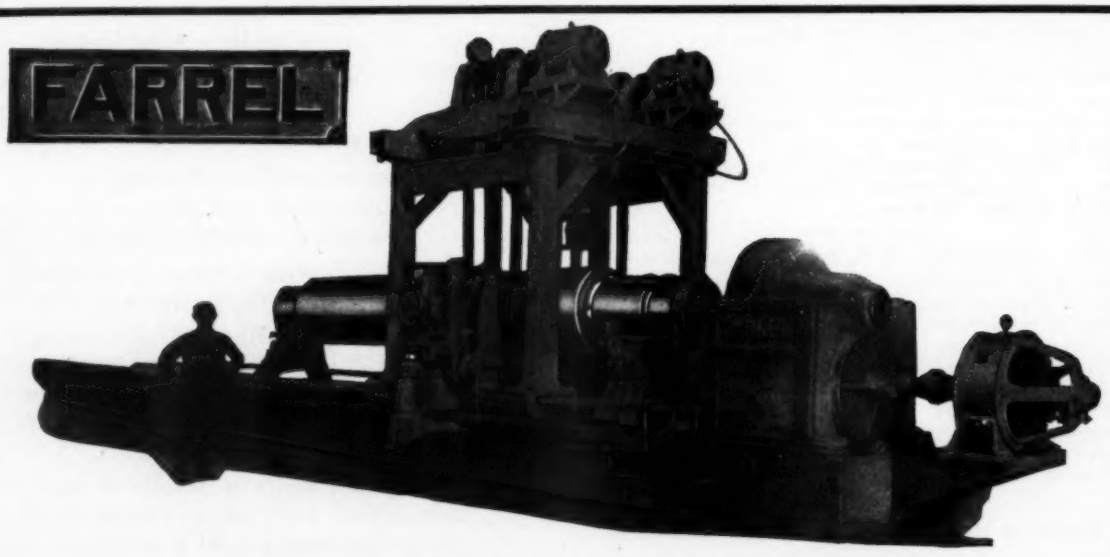
83% (approx.) of the Canadian mills producing 25 tons per day and over.

Figures that speak for themselves!

NASH ENGINEERING COMPANY 164 WILSON ROAD, SO. NORWALK, CONN.

Nash Hytor

VACUUM PUMPS AND COMPRESSORS



FARREL 36″ NEW TYPE ROLL GRINDER

The SWING REST PRINCIPLE is an EXCLUSIVE FEATURE on the FARREL GRINDERS, providing for GREATER ACCURACY than can be obtained on grinders without this feature. These machines are built in 24″, 32″, 36″ and 42″ sizes. Electrically driven throughout.

FARREL-BIRMINGHAM COMPANY INC.,

ANSONIA, CONN.

Successor to: Farrel Foundry & Machine Co., Ansonia, Conn., Est. 1848. Birmingham Iron Foundry, Derby, Conn., Est. 1836.

indefinite period, thus throwing three hundred men out of work. The output at Espanola and at Sturgeon Falls has been reduced to a minimum, and starting July 1st a second machine is being closed down at the Sault Ste. Marie mill, leaving only two of the four machines in that mill in operation.

Ontario has not started off on the right foot this year in so far as forest fire losses are concerned. Hon. William Finlayson, Minister of Lands and Forests, stated towards the middle of last month that to date more timber and pulpwood acreage had been laid waste than was devastated during the whole of 1927, when approximately 35,000 acres were burned over. This year's losses to date have been confined practically to the northwestern corner of the Province, where lack of snow to begin with, and later lack of rain, created about the most serious spring fire hazard with which the department ever had to deal.

A. F. Ogle, formerly of Paper Sales, Ltd., has been appointed representative in Toronto of Mead-Patten Co. He will give particular attention to the distribution of the product of the new board mill of Frasers, Ltd., Edmunston, N. B., which is now about ready to begin operations.

The National Paper Co., of Hamilton, has leased the old west side public school at Thorold, which was used for the housing of soldiers during the war, from the Thorold school board. The building will be used for paper converting purposes.

The Newaygo Co., a subsidiary of the Consolidated Water Power and Paper Co., has purchased the all-steel freighter "Francis L. Robbins'' from the Becker Steamship Co. The boat is to be rechristened the "George W. Mead." It will be used to transport paper from the Thunder Bay paper mill to Chicago and can carry 7,000 tons. The boat, on its return trips, will carry a cargo of package freight.

Abitibi Power and Paper Co. has made an issue of $50,000,000 of first mortgage 5 per cent gold bonds, Series A, the proceeds of which will be applied to the retirement of funded debts of the constituent companies, with a resultant saving in annual interest charges. The mortgage will provide for a sinking fund to operate annually, commencing June 1, 1931, and sufficient to retire over 70 per cent in principal amount of Series A bonds by maturity in 1953.

BRITISH COLUMBIA

Westminster Paper Mills to Increase Capacity

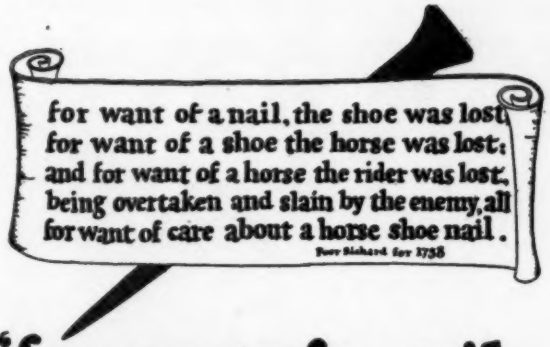
The Westminster Paper Mills, Ldt., of New Westminster, will spend $23,000 in increasing the capacity of its plant by the installation of additional machinery. Contract for a building to house the new equipment has been awarded to the Dominion Construction Co.

The company has also added a printing plant to its mill, which will be used for the printing of wrappers of all kinds, particularly those used in the fruit trade of British Columbia. A large rotary press manufactured by the Kidder Co., at Dover, N. H., was started up about June 15th.

NEW BRUNSWICK

Fraser's Expansion Program Nears Completion

Fraser Companies have recently put in operation a high grade paper board machine at their Edmundston mill, with a capacity of 65 tons a day. Fraser now has in operation four high grade paper machines, which are operating at a


for want of a nail, the shoe was lost;
for want of a shoe the horse was lost;
and for want of a horse the rider was lost,
being overtaken and slain by the enemy, all
for want of care about a horse shoe nail.
Poor Richard for 1758

"for want of a nail ... the rider was lost"

POOR Richard might well have been thinking about paper mills when he wrote that. For there is certainly one operation—cleaning—where the old saying fits in.

Washing felts is a good example. Unless care is taken to do the job right, the life of the felt is unnecessarily shortened. Its absorbent quality is impaired. That in turn means increased steam consumption. Greater overhead is the result.

Costly consequences of a small neglect—and unnecessary! For every paper mill cleaning job can be done safely, thoroughly and efficiently with Oakite cleaning materials. With a minimum of time and labor, and most important, without harm to equipment.

Take your cue from Poor Richard. Write us today for details about Oakite methods and their application to any cleaning problem you may have. No obligation, of course.

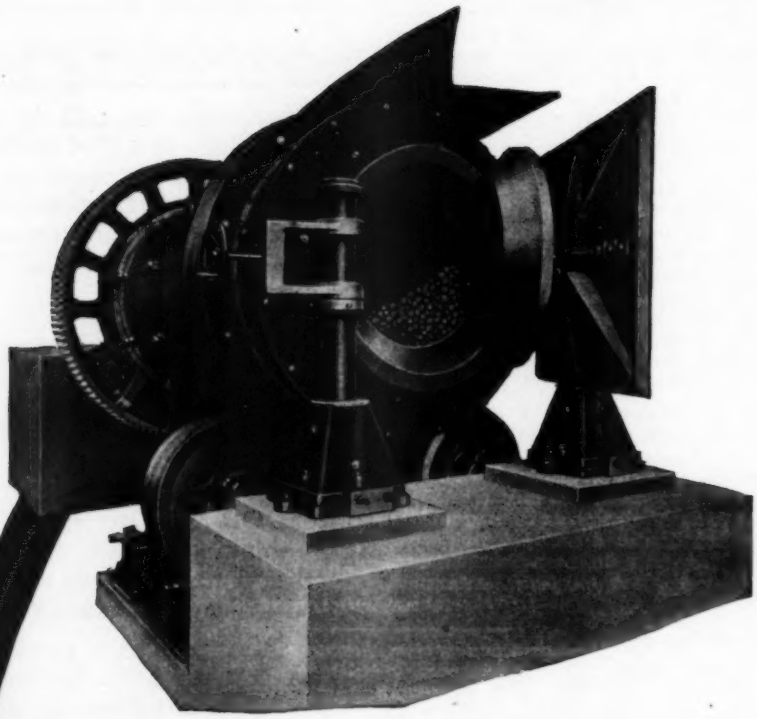
Manufactured only by
OAKITE PRODUCTS, INC., 16A Thames St., NEW YORK, N. Y.

Oakite Service Men, cleaning specialists, are located at

Albany, N. Y., Allentown, Pa., Altoona, Pa., *Atlanta, Baltimore, Birmingham, Ala., *Boston, Bridgeport, *Brooklyn, N. Y., Buffalo, *Camden, N. J., Canton, O., Charlotte, N. C., Chattanooga, Tenn., *Chicago, *Cincinnati, *Cleveland, *Columbus, O., *Dallas, *Davenport, *Dayton, O., *Denver, *Des Moines, *Detroit, Erie, Pa., Fall River, Mass., Flint, Mich., Fresno, Cal., *Grand Rapids, Mich., Greenville, S. C., Harrisburg, Pa., Hartford, *Houston, Tex., *Indianapolis, *Jacksonville, Fla., *Kansas City, Mo., *Los Angeles, Louisville, Ky., Madison, Wis., *Memphis, Tenn., *Milwaukee, *Minneapolis, *Moline, Ill., *Montreal, Newark, N. J., Newburgh, N. Y., New Haven, *New York, *Oakland, Cal., *Omaha, Neb., Oshkosh, Wis., *Philadelphia, Phoenix, Ariz., *Pittsburgh, Pleasantville, N. Y., Portland, Me., *Portland, Ore., Poughkeepsie, N. Y., Providence, Richmond, Va., Reading, Pa., *Rochester, N. Y., Rockford, Ill., *Rock Island, *San Francisco, *Seattle, *St. Louis, *St. Paul, South Bend, Ind., Springfield, Mass., Syracuse, N. Y., *Toledo, *Toronto, Trenton, *Tulsa, Okla., Utica, N. Y., Williamsport, Pa., Worcester, Mass.

*Stocks of Oakite materials are carried in these cities.

OAKITE
TRADE MARK REG. U.S. PAT. OFF.
Industrial Cleaning Materials and Methods



How to Make Screenings Worth More

The Marcy *Open End* Rod Mill offers to newsprint mills two ways of making screenings worth more:—

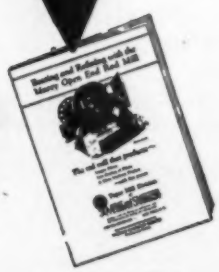
1. Screenings can be so refined that they are suitable to turn into the pulp stream.
2. Or they can be so refined as to make better wrapper.

Taking Case 1—The Marcy Mill by its incessant pounding action on the screenings liberates a very appreciable quantity of fibers entirely suitable for newsprint.

Case 2—These better quality fibers as liberated can be utilized for making better wrapping paper.

Either case represents profitable treatment.

Marcy Mill engineers will be glad to detail the specific benefits the Marcy Mill will give to your operations.



Send for this Bulletin. In it are given the advantages and construction details of the Marcy *Open End* Rod Mill.

The MINE and SMELTER SUPPLY COMPANY

Licensee under the Marcy Rod Mill Patents.

NEW YORK DENVER

Manufactured in Canada by William Hamilton Limited, Peterborough, Ontario

capacity of 165 tons per day. Adding to this capacity the new Edmundston board machine of 65 tons daily and the unbleached sulphite output of the company's Chatham mill, gives the company a present total productive capacity of high grade paper and board of 230 tons, plus 65 tons of unbleached pulp, or approximately 300 tons per day.

Installation of the company's fifth machine, having a capacity of 65 tons a day of catalogue paper, is proceeding, as is also installation of a 135-ton board machine at Madawaska. These two machines should be operating by September 1st, from which date Fraser will have a total productive capacity of some 500 tons per day of high grade paper and board products.

September 1st will mark the completion of the construction program started a year ago, and while the company should have substantially increased earnings due to this gradually increasing output during the current year, full advantage of new construction will not be felt until next year.

Current earnings are understood to be running at a satisfactory rate and the company's liquid position is reported strong, there being no bank indebtedness.

Industry to Develop in New Brunswick

At a banquet held in his honor at St. John, Premier J. B. M. Baxter announced that a capital expenditure of between $30,000,000 and $40,000,000 would be involved in the development of the pulp and paper industry in the province during the next few years.

The program, the Premier said, would include two new mills to be erected by International Paper, one a two-machine news print mill at Dalhousie, on the Restigouche River, capable of extension to four machines within four or five years, and a 100-ton sulphite mill next year on the Miramichi River. These two projects would require a capital expenditure of at least $20,000,000 with another $5,000,000 for working capital.

At Athol, on the Restigouche River near Campbellton, the Fraser Companies have decided to erect a 150-ton sulphite mill costing in the neighborhood of $4,500,000, construction of which will commence in September; while at Millbank, on the Miramichi, the same company proposes either to erect a new 100-ton pulp mill or extend their present plant to a capacity of 100 tons per day, at a cost of about $2,500,000. Extensions already commenced at Edmundston will bring the total production of the Fraser mill there up from 40,000 tons to 117,000 tons per year; while the Bathurst Co., at Bathurst, is doubling its capacity by the addition of a second news print machine.

NOVA SCOTIA

McLeod Mills Started Up Again

The McLeod Pulp and Paper Co. has resumed operations at Rapid Falls and at Cowie Falls, on the Mersey River. The mills had been idle for nearly a year and a half and of late have undergone extensive renovations. Austin Parker is the manager. The capacity is about 45 tons of groundwood a day.

The company is well supplied with wood for both mills, having raw material on hand sufficient to last them for a year. Contracts are reported to have been signed with English paper manufacturing concerns to take practically the whole output which will be shipped overseas for the balance of the year.

Lake Rossignol will be the site of a large water storage to be constructed by the Royal Securities Corp. in connection with the power and paper project on the Mersey River. The power development will comprise three units, namely, Lake Falls, 13,000 horsepower; Big Falls, 9,000 horsepower; Lower Great Brooks Falls, 3,300 horsepower. The transmission line from Lake Falls to the large paper mill to be constructed at Sandy Cove, will be about 20 miles in length.

RYERSON

Immediate Shipment from Stock

Bars, Shapes, Structurals, Rails, Plates, Sheets, Rivets, Bolts, Nails, Wire, Chain, Turnbuckles, Shafting, Boiler Tubes, Boiler Fittings, Corrugated Sheets, Concrete Reinforcing, Welding Rods, Babbitt Metal, Tool Steel, Bar Iron, Refined Iron, Floor Plates, Safety Treads, Small Tools, Machine Tools, etc.

Write for the Journal and Stock List—the "key" to Immediate Steel.

JOSEPH T. RYERSON & SON INC.

Chicago Milwaukee Buffalo St. Louis New York Cincinnati Boston Detroit

STEEL

FORTY YEARS

When an article enjoys steadily increasing sales for forty years it must have merit.

STEPHENSON BAR BELT DRESSING has increased in popularity since 1888. This fact, and it is a fact, should make you wish to give it a trial. A sample is yours for the asking and incurs no obligation on your part.

Sold by most Jobbers.

Sole Makers

Stephenson Mfg. Co.

Albany, N. Y.

STEPHENSON MFG. CO.
ALBANY, N. Y.

Send free sample.

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Something for Nothing!

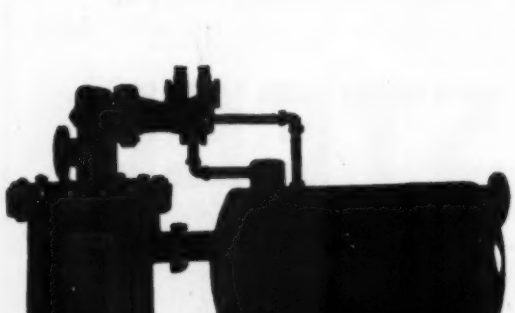
The old adage is disproven!

Farnsworth equipment

and

Farnsworth Systems

Cost you nothing



The Farnsworth Drainage Receiver and Pump is paying for itself every three months in some installations. Feed water temperatures as high as 350° are being obtained.

There are only two wearing parts on the pump—the steam and exhaust valves.

Its steam consumption is 75% less than other types of pumps, and it meters the condensate that it handles.

This is but one of the many types of equipment made by the Farnsworth Co.

How often you may have wanted new methods of handling your condensate! or perhaps your steam circulation problems!

And yet because of the expense involved, you didn't feel you could afford it.

Often, too, there has been the fear that after new equipment or systems were purchased they might not improve conditions—might not warrant the expenditure!

Farnsworth equipment and systems are installed for a thirty day trial period. The purchaser can easily tell just what the savings will be.

If the equipment does not make savings at the rate of paying for itself in one year, or if the purchaser is in any way unsatisfied with the equipment, WE WANT IT BACK!

THE SAVINGS EFFECTED BUY THE EQUIPMENT IN LESS THAN ONE YEAR! The savings pay *us*—the equipment costs *you* NOTHING!

And then of course, the system or equipment keeps right on paying dividends through years of uninterrupted faithful service.

NEW EQUIPMENT FREE plus ENORMOUS SAVINGS.

Let us tell you more about it!

We are interested in getting in touch with responsible representatives in a few territories where we are not now represented. We prefer representatives with an established business handling steam plant equipment.

FARNSWORTH COMPANY

Heat Reclamation Engineers

CONSHOHOCKEN, PENNA.

The promoters expect that the entire project will call for an outlay of appriximatly 4,000,000.

The Canadian Ingersoll-Rand Co., Montreal, has announced the appointment of C. E. Planck as manager of the Pulp and paper department. Mr. Planck will also continue to guide the Cameron pump department as in the past. He brings to this work many years' experience with the company in the application of its productions and in the solution of pumping and other problems in pulp and paper mills. He will be assisted in his work by E. T. Harbert, who has been appointed engineer of pulp and paper research. It is the company's policy in Mr. Harbert's appointment to this position to give the industry the benefit of this research. Mr. Harbert is now devoting his whole time to work in connection with the B. I. and S. Micro-Seal Condensate Removal System, the Van de Carr thin stock consistency regulator, the Haug refiner and the Shortt trap.

New Holding Company for International Paper Co.

The stockholders of International Paper Company have recently received a letter enclosing a Plan and Agreement for the recasting of the International Paper capital structure through the formation of a new holding company to be named "International Paper and Power Company". Under the provisions of the Plan and Agreement the stockholders of International Paper Company are asked to deposit their preferred and common stock in exchange for shares of this New Company on the following basis:

(a) For each share of 7 per cent Preferred Stock of International Paper Company they are to receive one share of 7 per cent Preferred Stock of the New Company.

(b) For each share of 6 per cent Preferred Stock of International Paper Company they are to receive one share of 6 per cent Preferred Stock of the New Company.

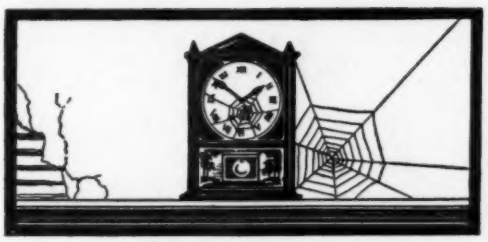
(c) For each share of Common Stock of International Paper Company they are to receive one share of Class A Common Stock, one share of Class B Common Stock and one share of Class C Common Stock of the New Company, a total of three shares.

The three classes of common stock which the New Company is to issue initially will be of no par value and will be designated as Class A Common Stock, Class B Common Stock and Class C Common Stock and the shares of each class will be entitled to vote. Class A Common Stock will be entitled to aggregate dividends of $12. a share from the date of the commencement of dividends on the Class A Common Stock before Class B Common Stock receives dividends, whereupon Class A Common Stock and Class B Common Stock will constitute one class which from that time will be entitled to further aggregate dividends of $12. a share before the Class C Common Stock receives dividends, and thereafter the separate classes of common stock will disappear and all shares originally constituting Classes A, B and C Common Stock will be simply shares of Common Stock. The New Company will be free to issue further shares of any such class at any time, but if the dividend priority of the class to which such further shares belong is not then fully satisfied, such further shares will be entitled to a priority as to dividends only to the unsatisfied amount of the dividend priority of such class.

The International Paper Company has acquired extensive pulp and paper mill properties, woodlands, water powers and hydro-electric developments in the United States, Canada and Newfoundland. These interests have become so widespread and diversified that the Company has outgrown its present capital structure. It has therefore been deemed advisable to form the New Company named above which will be a holding company directing the activities of these various interests and which it is expected will acquire substantially the entire control of the New England Power Association.

Orval A. Wales, of Johaneson, Wales & Sparre, Inc., wood pulp importers and agents of 250 Park avenue, New York, sailed from New York on June 8 on a business trip to Europe.

Even a STOPPED clock is right TWICE A DAY!



NO matter what kind of instrument records you now use, it is bound to be better than guesswork.

But what prices are you paying in wasted fuel or goods that are not up to standard requirements by not putting Foxboro Recorder-Controllers in full control?

FOXBORO AUTOMATIC TEMPERATURE RECORDER-CONTROLLER
Foxboro Controls and Records from the same Thermal Element. This insures accuracy.

On your digestors, for example, one Foxboro Instrument records both temperatures and pressures on a single chart. There are no curves to plot. The Two-Pen Records instantly give warning of variation. Or Foxboro Temperature Recorder-Controllers on your drying rolls will keep the temperature at whatever point you desire without any manual control. Foxboro Controllers are air-actuated which means positive trouble-free action of valves.

Foxboro Guarantee sealed to each Controlling and Recording Instrument.

Each Foxboro Recording and Controlling Instrument is sealed with a definite guarantee that the instrument will do just what we claim for it. Foxboro Instruments are the only instruments so guaranteed. We suggest that you get in touch with our nearest branch.

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Veponset Avenue, Foxboro, Mass., U.S.A.

NEW YORK · CHICAGO · BOSTON · PHILADELPHIA · DETROIT
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REG. U. S. PAT. OFF.

THE COMPASS OF INDUSTRY

INSTRUMENTS FOR CONTROLLING, RECORDING AND INDICATING TEMPERATURE, FLOW, HUMIDITY AND PRESSURE

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Manufacturer of

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for 42 years

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Commercial Alum
Iron Free Alum
Salt Cake
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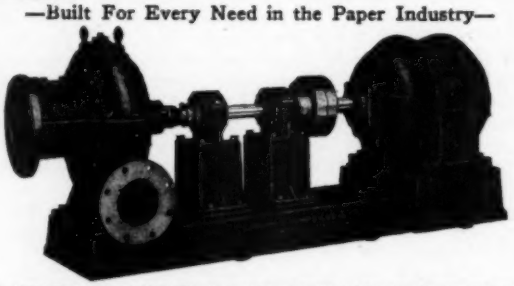
BOSTON,
MASS.

LAWRENCE
"VORTEX" CENTRIFUGAL PUMPS

—Built For Every Need in the Paper Industry—



LAWRENCE "VORTEX" BALL BEARING STOCK PUMP
A STOCK PUMP THAT STAYS ON THE JOB

Designed by Engineers who have specialized in pulp and paper mill requirements. A STOCK PUMP that will absolutely deliver the "stuff" faster, continuously, and more efficiently, and will not clog.

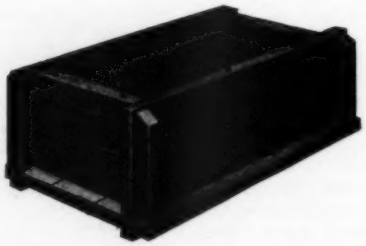
Rugged construction throughout. Heavy shaft. Oversize heavy duty Ball Bearings guarantee long life with least attention.

Our Engineers are always ready to help you with pumping problems. Write for Bulletins.

Lawrence Pump & Engine Co.
P. O. BOX 70,
LAWRENCE, MASS.
N. Y. Office—90 West St.

STEARNS TANKS

BOX TANKS
ROUND TANKS
HALF ROUND
TANKS



ACID TOWERS
STUFF CHESTS
STAVE PIPE

If it is a wood tank of any shape or design we can make it for you. Our engineering department is ready to assist and advise you.

The A. T. Stearns Lumber Co.
NEPONSET, BOSTON, MASS.

EVERYTHING IN WOOD OR WOODWORK 1849

STEARNS TANKS

NEW ENGLAND NEWS

Bird & Sons Make Mulch Paper

Keen interest is being manifested in the new paper just introduced in this section by Bird & Son Inc., of East Walpole. The new product is a mulch paper similar in purpose to other papers of this kind that have proven so successful in various parts of the world. Bird & Son Inc., have secured the co-operation of their employees in making thorough tests with the stock this summer. They have offered financial rewards for accepted reports and photographs by employees showing actual results of the use of the mulch paper in home gardens. Bird's Mulch paper is made in plain and improved perforated styles, rolls 36 inches and 18 inches wide containing 900 square feet in either size, with an approximate weight of 45 pounds per roll.

The paper mulch which is being manufactured by Bird & Son under patents held by C. F. Eckart is a type of asphalt perforated stock. Its use on small farms is generally recommended and results achieved in experiment stations so far have been really remarkable according to the East Walpole manufacturers. Any striking results achieved by the Bird & Son employees this year will be turned over to Government authorities and the U. S. Department of Agriculture is seeking all available data and is conducting many experiments at its own farms.

Crocker Burbank Power Plant

Progress is reported in the construction of the new Crocker Burbank power plant at Fitchburg, Mass., which will serve all the six mills of the company eventually. At present, the company derives both its motive power and process steam from individual plants connected with each mill. The new plant will manufacture electrical power at the main station and transport process steam through a series of overground pipe lines to the various mills.

Three new Babcock and Wilcox boilers are to be installed during July and August, each to be equipped with a unit aero type powdered coal burner produced and installed by the Foster Wheeler Corporation. To meet the varying loads, particularly the peak production and the light week end requirements, the burners are equipped to drive the boilers at an average of 250 per cent of rating and a range from 50 per cent to 350 per cent. The boilers will be equipped with radiant heat Foster superheaters and Foster economizers.

An interesting fact in connection with the installation was the decision of the Crocker Burbank Co. officials to maintain oil burners of the Hammell type which can be utilized almost immediately if the occasion arose. These will also be capable of driving the boilers at 300 per cent of rating and will carry a light 50 per cent load most handily. They are also installed with the idea of providing insurance against any undue fluctuation in the coal market, or a drop in the price of oil that might make their operation more economical.

A non-condenser turbine will take the steam from the boilers at about 385 pounds pressure and 50 per cent superheat and transform it into electrical energy which will be wired to all the mills where new electrical drives are being installed for its reception. The exhaust steam will enter the pipe lines at 25 per cent superheat and 50 lbs. pressure for process purposes. It is probable that the plant will be in operation about November 1st.

A new brick, concrete and steel raw material warehouse is about to be constructed by the Morton C. Tuttle Co., of Boston for Tileston & Hollingsworth Co., at their Hyde Park, Boston plant. It will be equipped with modern baling and handling devices. This company is soon to have delivery on a new E. D. Jones beater and has rebuilt all its old beaters.

Shipments of foreign pulp to New England ports are breaking records for June as importers strive to make up for lack of production. It is probable that shipment through

Why Butterworth Rolls Give Long Service

BUTTERWORTH Cotton Rolls are made of long staple cotton, especially selected, and in Butterworth Paper Rolls for super and glassine, we use only the best quality of paper obtainable.

IT SEEMS REASONABLE

doesn't it, that with such high grade material and fifty years of experience in roll-making that Butterworth Calender Rolls should give many extra hours of service.

THEY DO

Wm. S. Maull, Manager of the Dill and Collins Plant, Philadelphia, wrote us recently "The rolls have long life."

A new folder telling all about Butterworth Calender Rolls is available. Your copy is ready to mail.

H. W. BUTTERWORTH & SONS CO.

Established 1820

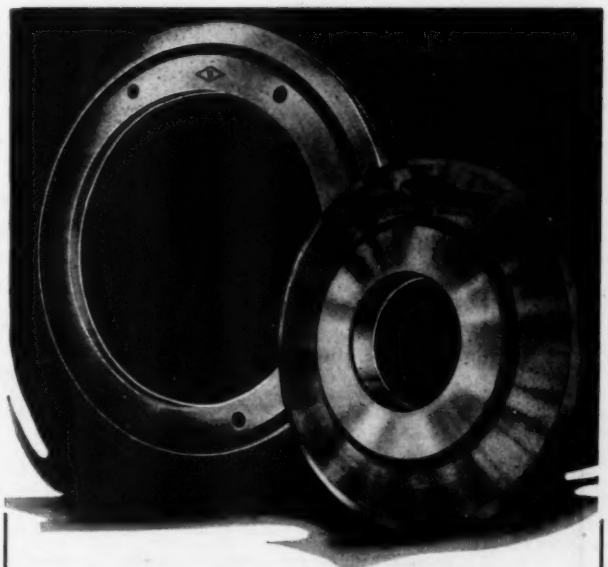
Philadelphia

Plants at Philadelphia and Bethayres, Pa.

Canadian Representative:
W. J. Westaway Company
Hamilton, Ontario, Can.

Providence Office:
Turks Head Building

Southern Office:
1211 Johnston Bldg., Charlotte, N. C.



Simonds Circular Paper Slitters

Edge-holding—that explains why mills in every section are turning to SIMONDS for the Circular Slitters that give them better work and more production. Simonds Slitters are true to form and perfect mechanically.

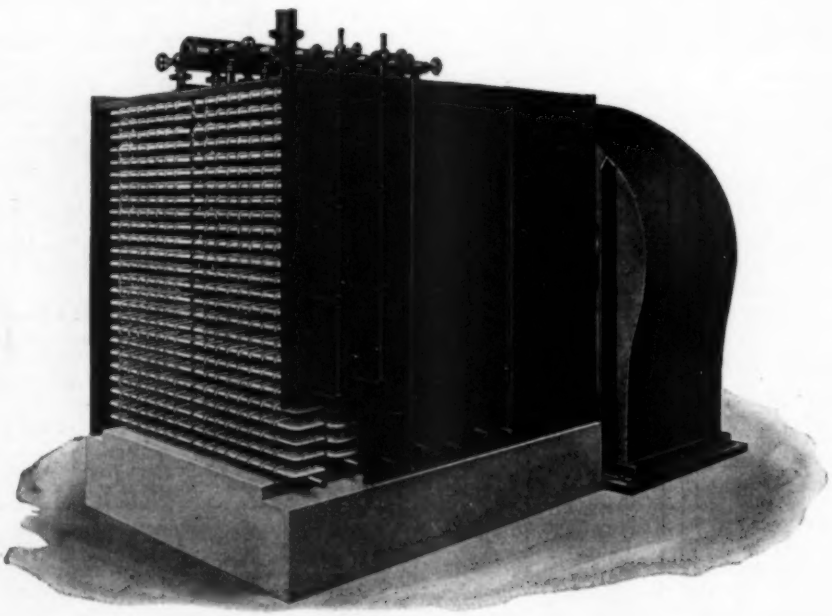
Order them from any Simonds factory or service station.

Simonds Saw and Steel Company

ESTABLISHED 1832—FITCHBURG, MASS.

Chicago, Ill. Boston, Mass. Detroit, Mich. New York City
New Orleans, La. Memphis, Tenn. Atlanta, Ga. Portland, Ore.
San Francisco, Cal. Los Angeles, Cal. Seattle, Wash. Montreal, Que.
Toronto, Ont. Vancouver, B. C. St. John, N. B.

Stickle Blast Coil Heater or Economizer Will Dry Your Felts With Hot Air



STICKLE air cooled condenser maintains a vacuum of 10 to 15 inches on the return line of your paper machine, returns condensate to the boiler room as hot as it can be handled with a pump without the admission of cooling water. Will heat 1000 cubic feet of air per minute for every ton of paper dried per day, furnishing hot air in the pit to dry the felts and absorb the vapor under the dryers, making a direct saving of at least 15 per cent in steam consumed for drying the paper and ventilating the machine room. This can be done at a moderate cost. Are you interested? Complete plans furnished without charge.

Stickle Steam Specialties Co.
INDIANAPOLIS, IND.

AUTOMATIC STEAM CONTROLS
BLOWING THROUGH DRAINAGE SYSTEMS
COMPLETE LINE STEAM SPECIALTIES

Portland will amount to 25,000 tons for June of which some 10,000 tons arrived during the last week of the month. Canadian pulp is figured quite prominently, two steamers with 5000 to 6000 tons coming in from Nova Scotia. In addition, the movement of pulpwood for Hollingsworth & Whitney, S. D. Warren Co., International Paper Co., at Livermore Falls and Oxford Paper Co., indicates a record month during June. This wood comes from Nova Scotia and New Brunswick.

Concentration of power production in one huge 1000 k. w. turbine generator has been accomplished at the Parker Young Co., at Lincoln, N. H. After their plant was badly damaged in the floods of last November, the company decided that they required more electric power as well as increased low pressure steam for process purposes. The new large turbine was decided upon as the solution to this problem. In order to accomodate this enlarged electrical generating capacity, Foster Wheeler & Co. superheaters were installed on the boilers of the No. 3 steam plant. These superheaters increase the steam temperature from 388 degrees to 488 degrees. The steam pressure was raised from 150 pounds per square inch to 200 pounds per square inch. To care for this increased pressure, a new 12 inch welded pipe line was built. To give greater flexibility, a 750 k. w. frequency changer has been placed between the 25 cycle and 60 cycle busses.

Freight Association Hearings

New England Freight Association held a hearing on June 19th at the rooms in the South Station, Boston, on the proposed cancellation of the woodpulp commodity rate from South Brewer, and Great Works, Me., to New York City on export traffic. The rate has been 27.50 cents and the proposal is to make it 30.50 cents per hundred. The tariff has been of great aid in building up the Eastern's export trade on their rayon cellulose and the Penobscot Chemical Fibre Co., at Great Works has developed a satisfactory and growing trade in Europe on soda pulp.

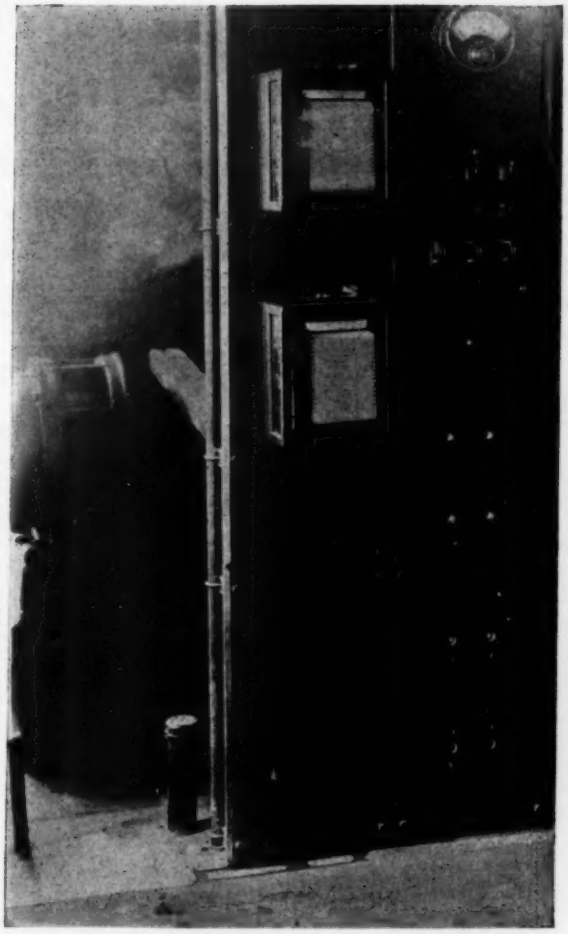
The New England Freight Association also proposed cancellation of less carload commodity rates on paper from New England to the southeast. There are a variety of papers which utilize less carload shipments, but of chief interest has been the growing trade in textile wrapping papers shipped by New England mills to the textile centers of the Carolinas and Georgia. The cotton manufacturers have little space for the storage of this stock and generally ask for shipments at regular intervals in relatively small quantities. Inasmuch as there is every likelihod that the association will go ahead with its proposal, and as other commodities are affected it is likely that a request for suspension of the rates will be filed with the I. C. C.

A report reaches this city that the Chase Fibre Co., of Passumsic, Vt., is shortly to be liquidated. The plant was badly damaged by the flood last November. For a time it was thought that the buildings and machinery would be rehabilitated and 50 cents on the dollar was offered to merchandise creditors and application was made for a loan to the Vermont Flood Corporation.

Hollingsworth & Vose Co., have introduced a new rope paper on the market known as "Pletex." It is a strictly No. 1 white rope sheet for pleating purposes in the garment trades. Distributors in and about New York are the Reliance Paper & Twine Mills.

The first distributor in New England officially appointed for the New International Paper Co., bond and ledger "Adirondak" is John Carter & Co., of Boston, who will carry the line in stock at Boston and New Haven, Conn.

The Babbit Kelley Paper Co., at Bellows Falls, Vt., which was badly damaged by the flood last November and has since occupied another plant, is reported to be completing improvements to its present plant including a power plant for



Bristol's Recording Liquid Level Gauges

Prevent Litigation Over Water Rights

The large number of power, pulp and paper plants along the Fox River in Wisconsin makes necessary very careful supervision of water allotment. As one plant engineer remarks:

As each user of water power is entitled to a predetermined amount of water, which, if excelled causes disputes, and sometimes costly litigation. It is necessary that the various water levels be carefully controlled.

"To accurately determine the uniformity of apportionment we installed Bristol's Recording Liquid Level Gauges. These water level instruments, (shown mounted on panel Board above) automatically indicate as well as record head and tail water levels maintained. This eliminates the human factor so far as records are concerned, and places the user of these instruments in a position to produce authentic records as to water used."

More complete information descriptive of the varied adaptation of Bristol's Liquid Level Gauges is contained in new Liquid Level Catalog No. 1800, just off the press. Write for a copy.

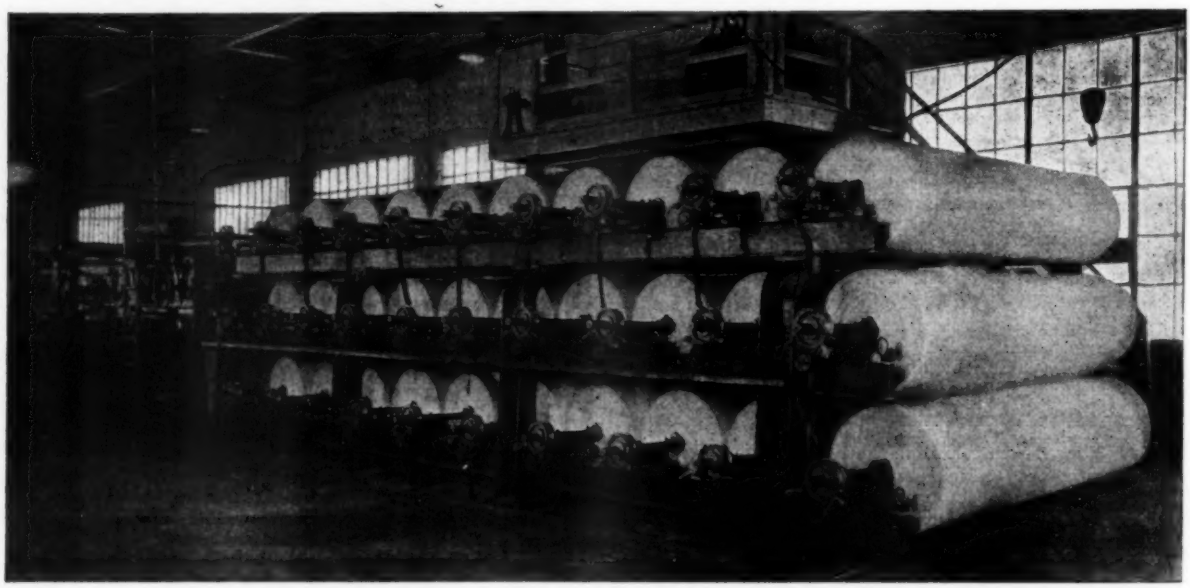
The Bristol Company

WATERBURY CONNECTICUT

For Increased Production in Cutter Rooms Use "M&W" Cutters, Lay Boys, Backstands

BUILT TO ENDURE

It's a Moore & White Installation . . . . . .



The picture shows Thirty-Roll Backstand used in connection with Moore & White 130" Duplex Cutter and Lay Boy. Cutter equipped with seven pairs of Slitters and Lay Boy arranged to lay six piles of paper. Backstand is loaded with thirty rolls of 14 lb. fruit-wrapping paper, each roll weighing 2000 pounds. This is one of three such installations. Name of mill on application.

FIRST CHOICE ALWAYS

(95% of All Paper Mills in U. S. use "M&W" Lay Boys)

Catalog No. 4 on Request

The MOORE & WHITE CO.
PHILADELPHIA, PA.
N. PHILA. STA. PENNA. R.R.
PAPER MILL MACHINERY

process steam. Electrical power will be supplied by the New England Power Association to whom Babbitt Kelley has either sold or leased its former valuable site on the Connecticult River.

We understand that the improvements contemplated at the mills of the American Writing Paper Co., during the rest of year will cost $500,000. A new stock house is to be erected, new equipment is to be installed and the interior of several mills is to be altered.

A. M. Phillips of S. Sternburg, London, manufacturers of fourdrinier wires, who visited New England mills with his local representative George M. Graves Co., 77 Summer street, Boston, made a tour of other American mills, and after a visit to the trade in Canada sailed for England on June 28.

There was great rejoicing at Woodland, Me., at the end of June when it became known that the big newsprint mill of the St. Croix Paper Co. had completed a six month period from January 1st without a single lost time accident. Considering the fact that the company employs upwards of 400 men, this record is considered remarkable.

Maurice E. Whalen

Maurice E. Whalen, for fourteen years superintendent of the Nonotuck Division of the American Writing Paper Co., died last month at the age of 72 years. His father had an unusual record in the industry, being 52 years in charge of beaters and washers in the Warren mills. It was under parental direction at the age of 14 that Mr. Whalen began his career in papermaking. His first job at Holyoke was with the Winona Paper Co., which became the George C. Gill mill. He later worked in the Nonotuck Division, then in the Syms & Dudley Division. He was superintendent with the Holden Paper Co. for five years, later with the Sterling Paper Co., Hamilton, Ohio.

Mr. Whalen is survived by a wife, two daughters and two sons, one of which is conencted with the American Writing Paper Co.

Dockage charges of 25 cents per cargo ton are now to be assessed at Commonwealth piers in South Boston and East Boston on cargo freight. Considerable woodpulp is imported over these piers. The charge applies within a restricted area that includes however, Fitchburg, Lawrence and other mill points.

The Collins Manufacturing Co., of North Wilbraham, Mass., announces that Thomas Duff, formerly superintendent of the Beebe-Holbrook Division of the American Writing Co., has accepted a position as superintendent at the North Wilbraham plant.

John A. Sherman, who developed a method of manufacturing envelopes and at one time was superintendent of the Whitcomb Envelope Co., now part of the United States Envelope Co., died last month at the age of 76 in Worcester, Mass. Until 1920, he was president of the Sherman Envelope Co., which he had founded 20 years previously.

One machine of the Eaton Paper Co., formerly the Berkshire Hills Paper Co., at North Adams, Mass., now owned by Eaton Crane and Pike and Henry J. Guild, started operation this month. George Verro, who came to the Eaton Paper Co., from the Katahdin Division of the Eastern Manufacturing Co., at Lincoln, Me., is superintendent of the Adams plant and has expert knowledge of the paper to be made there, for it was under his charge that this same paper was formerly made in Maine. Considerable repairs and new equipment were found necessary to the plant. The second machine will probably start operations about July 9.

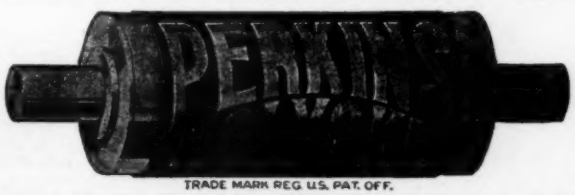
Offices of the Advance Bag & Paper Co., at 301 Congress Street, Boston, report that the Southern Advance mill at Hodge, La., has started operations. The 240 inch Pusey &

PERKINS HOLYOKE
CALENDER ROLLS
'No Calender can be better than the Rolls in it'

Since 1873, Perkins Calender Rolls have been built to meet exactly the requirements of paper makers. The marked individuality of Perkins Calender Rolls has been developed through long years of close application to the problems of the paper industry.

Perkins Calender Rolls are uniform, resilient, resistant. They stand heat better and wear longer.

B. F. Perkins & Son, Inc., Holyoke, Mass.



TRADE MARK REG. U.S. PAT. OFF.

COTTON ROLLS - PAPER ROLLS - EMBOSSING ROLLS - CHILLED IRON ROLLS - GRANITE PRESS ROLLS - WEB SUPERCALENDERS - GLASSINE SUPERCALENDERS - FRICTION CALENDERS EMBOSSING CALENDERS - SHEET CALENDERS - PLATERS - MULLEN PAPER TESTERS TENSILE TESTERS - VENTILATING FANS - RAG CUTTERS - STOCK CUTTERS - PAPER DAMPENERS BLEACH EJECTORS

LOOK SOUTH

BASTROP, Louisiana "Gator-Hide Kraft" four big machines, and Dilts New Type Beating Engines.

CAMDEN, Arkansas (International Paper Co.) Two 212″ Kraft Machines, and Dilts New Type Beaters.

HODGE, Louisiana (Advance Bag Company,) widest machine in the United States, 242″ on kraft, and Dilts New Type Beaters.

TUSCALOOSA, Alabama (E-Z Opener Bag Co.) 230″ Kraft Machine and Dilts New Type Beaters.

"Your paper is made in your Beaters."

Dilts

MACHINE WORKS, Inc. FULTON, N.Y.

EXPORT OFFICE ~15 PARK ROW~ NEW YORK CITY

Jones fourdrinier started production early in June under the eyes of John E. Kelley, president and J. N. Harvey, vice president and treasurer. Mr. Harvey was much pleased with the progress made. On his return to Boston he stated that twenty bag machines or one line had been installed which will absorb much of the current production. These machines were made in the company's own shops at Middletown. Grocery bags will be the product. Space for additional paper and bag machines has been provided. Three Dilts beaters and six Appleton jordans are at present installed to serve this machine. It is understood that the same general outlets as now serve the Maine mill will be utilized as distributing agencies for the Southern Advance bags.

Thomas Duff, who for the past seven years has been superintendent of the Beebe-Holbrook Division of the American Writing Paper Co., Holyoke, Mass., resigned from that company on July 1st. Mr. Duff returns to the Collins Manufacturing Company, North Wilbraham, Mass., as superintendent. He was employed by this company many years ago, and left them to go with the American Writing Paper Company.

OHIO NEWS

Miami Valley Supers Have Interesting Meeting

The June meeting of the Miami Valley Division was held June 30, at the Hotel Anthony Wayne in Hamilton, Ohio. H. H. Latimer, chairman, called the meeting to order and the regular business transactions were taken care of.

Mr. Eminger, National Secretary, thanked the members of the Miami Valley Division for their letter to the National Convention, recommending his nomination as National Secretary for the coming year.

A motion was carried to hold the next meeting on the last Saturday in October, at which time the officers for next year will be elected. The nominating committee appointed by the chairman was R. L. Eminger, H. C. Ferguson, and V. Freidrich, Jr. There is a probability of meeting in joint session with another organization in October, and in this event, the meeting will be held in Middletown. However, arrangements have not been completed and the place of the meeting not fully decided.

The Layne Ohio Company, well drillers, who have installed about 75 per cent of the wells for the Miami Valley paper mills, presented a paper through their vice president, H. B. Allen Sickel.

Water Conditions in the Miami Valley

Formation of the Valley—In the discussion which followed, Mr. Sickel explained the conditions of the original source of supply in Southwestern Ohio, which is part of a broad plateau which extends from the Ohio River at an elevation of about 900 feet to about 1100 feet in the Northeastern part of the plateau.

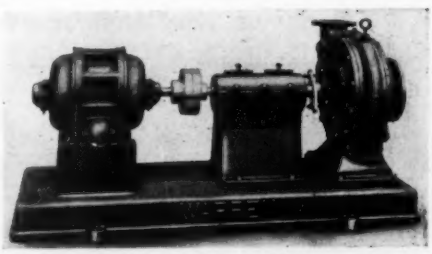
This plateau is cut by deep valleys and ravines, the most important being the valleys of the Miami, Little Miami, Mill and White Oak Creeks. It is taught in elementary geology that these valleys are the evidences of the passing of the great glaciers of prehistoric times. The entire region was covered with immense fields of ice which moved slowly southward. As it moved southward, it gradually melted and torrents of water rushing from beneath it cut valleys and gorges in the surface of the earth below. This water gradually collected in large rivers, some of which still exist and some of which we trace only by the deposits made by these streams.

Of these streams, the largest in this territory is the Miami, with its vast valley, the bottom of which is in some cases over three miles in breadth. This valley varies from 40 to 50 feet to 300 feet. In drilling wells in this valley, the average distance from the surface of the ground to the impervious strata underlying the water bearing sand and gravel is about 70 ft.

Specify Warren Pumps

if you believe that "low pumping cost per year" is more important than "first cost."

There is a Warren Centrifugal and Reciprocating Pump for every pulp and paper mill service. Write for Bulletin covering the services in which you are interested.



Warren Stuff Pump . . . will handle 6% clean stock efficiently and without clogging.

Warren

Steam Pump Company

Incorporated

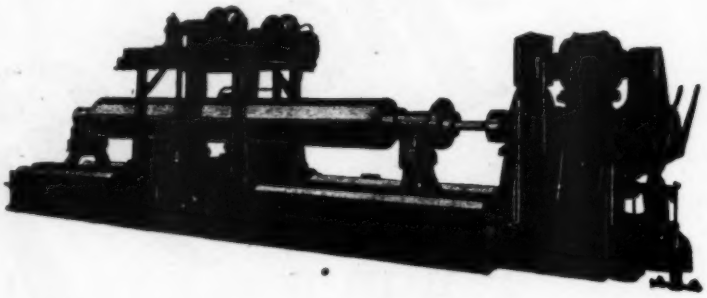
Warren, Mass.

Atlanta, Boston, Charlotte, Cleveland, Dallas, Kansas City, New Orleans, New York, Oklahoma City, Philadelphia, Pittsburgh, St. Louis, St. Paul, Seattle, San Francisco, Scranton, Toronto

1944

LOBDELL

IMPROVED ROLL GRINDING MACHINE



A new model with enclosed geared driving head and full automatic lubrication including the Vs. and the feed-screw.

RAPID
ACCURATE
LONG-LIVED

The automatic crowning device and the provision for leveling the bed are exclusive features of the Lobdell Roll Grinders.

LOBDELL CAR WHEEL COMPANY
Established 1836
WILMINGTON, DELAWARE

BARRE GRANITE IN PRESS ROLLS

Is Revolutionizing the Whole Paper Making Industry

If your Paper Machines are not equipped with Press Rolls of BARRE GRANITE you are not getting the results that you should get, for it is a recognized fact that granite rolls are much superior to any others and Barre Granite the best of all. Let us tell you about them.

Jones Brothers Company

BARRE, VT. **BOSTON, MASS.**

In Middletown the wells in the paper mills and city water works vary from 40 to 80 feet. In drilling test holes for The American Rolling Mill, water bearing gravel was found extending to a depth of 280 feet below the surface of the ground. Again, at the Coke Otto Plant the floor of this valley drops to about 200 feet, while wells in surrounding territory terminate at a depth of around 80 feet.

This shows that the glacial rivers cut deep channels in the softer floor of the plateau and in some places these cuts are much deeper than at others.

These streams would pick up the gravel that was carried along by the glacier and deposit same in these cuts and hence the vast gravel beds found in the Miami Valley today.

Other glaciers followed and the immense bodies of ice slowly pushing their way southward would grind down mountains, crushing rocks and pushing all before them in their relentless, crushing journey southward.

As this glacier passed over the valleys and gorges formed by previous glaciers, this mass of gravel would fill in these valleys and gorges. In some instances can be traced the evidences of several glaciers—each depositing a different variety of sand and gravel. Pebbles of granite can be found which have been carried from Canada.

Source of Water Supply—The abundance of water is due to several causes. As the valleys are much lower than the surrounding hills, they form natural lines of drainage, toward which the water in the rocks, as well as that upon the surface, moves. The water falling on the hillsides likewise finds its way into the valleys and is added to the supply. The main reason for the importance of the valleys as a source of water, however, arises from the gravel and sand with which the larger ones are filled to considerable depths; these materials, which have porosities of 25 to 40 per cent, hold immense quantities of water, which are readily given up to wells.

It is a common belief that the waters in this region are derived through subterranean sand passages from the Great Lakes. The level of Lake Michigan is 581 feet, which is only 75 feet above Cincinnati, and with the exception of a few of the valleys is several hundred feet below the general level of this part of Ohio. The elevation alone, therefore, precludes such a source for the waters.

Along the Ohio River another view, namely, that the ground water is derived from the river, is widely held by the people, who have long noted that in many places only the wells at or near river levels procure water. Careful studies of the ground waters, however, have shown that they move in a manner similar to surface waters; that is, from the hills towards the valleys, and join the streams or underground flows in the latter just as surely as the tributary joins the master surface stream.

Most of the ground water in valleys percolates from the surrounding hills, working its way downward through joints or fissures or other partings. On hilltops, the water is mainly derived directly from rainfall and represents the portion not yet absorbed by the deeper rocks.

Most of the water of the interbedded glacial deposits works its way downward from the surrounding highlands by seepage from bedding planes, along solution passages or through joints in the rocks in which the valley is cut. Occasionally, as during floods, when the water in the stream rises faster than that in the ground, the flow may be reversed and the river water may penetrate the alluvium on each side or may even force its way downward. As a rule, however, as is shown by the greater hardness of the water in the alluvium as compared with the river water, the alluvium contains chiefly the more mineralized waters from the rock hills. It also derives water directly from the rain that falls on its surface.

Improved Processes for Developing Wells—In the development of wells for the procuring of water from the sand and gravel formations there has been a vast improvement in the past ten years. The former practice was to sink an eight or ten inch casing through the gravel. The sample of sand that was removed in the sinking of this casing was studied and a brass strainer with openings find enough to prevent this sand from entering the well was installed and the well was pumped by single acting plunger pump. As the

Stretch your power dollar with C-H Magnetic Clutches

ARE you paying more for your electric power than you should? Are you using more high-starting-torque motors than necessary—motors which reduce the power factor, forcing you to pay a penalty?

C-H Magnetic Clutches solve your starting problems—open the way for using power-factor-boosting synchronous motors which reduce power costs.

With C-H Magnetic Clutches the motor reaches full synchronous speed and power without load. At the touch of a button the clutch picks up the load smoothly, without jerk or jar.

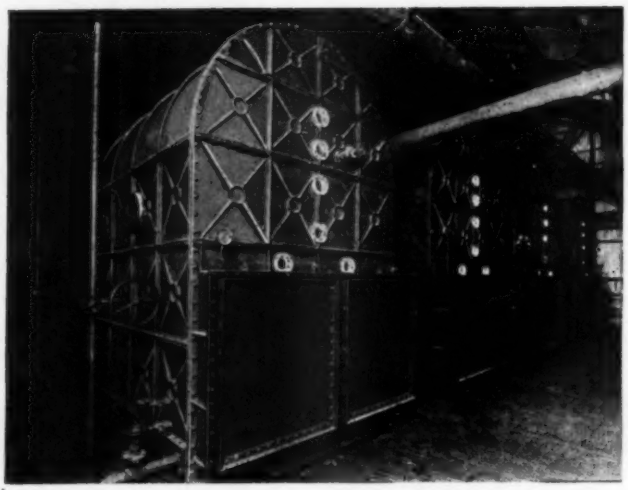
Saving of time and labor, economy of power, trouble-free service—reasons enough for investigating this most efficient, most simple clutch.

The CUTLER-HAMMER Mfg. Co.
Pioneer Manufacturers of Electric Control Apparatus
1273 St. Paul Avenue
MILWAUKEE, WISCONSIN

C-H Magnetic Clutch booklet shows many interesting paper mill applications—shows how C-H Clutches can help you stretch your power dollar. Just write for Publication P-27.

CUTLER HAMMER
Magnetic Clutches Save Time and Save Equipment

Swenson-Mount Recovery Systems



Swenson Quadruple Effect Evaporator, Tonawanda Paper Co.

Paper for "Liberty" is made in this mill

YEARS of service have proven the dependability of Swenson equipment for uninterrupted operation. Shutdowns for repairs are almost negligible.

Improved Swenson Evaporators and the Mount line for continuous causticizing and lime recovery effect appreciable savings in Pulp Mill operation.

Swenson engineers accept no improvement as final. Endless is their search for better methods for the recovery of valuable materials from waste liquors. Knowledge acquired in thirty-six years of experience will be applied to your problems.

Send for bulletins.

SWENSON EVAPORATOR COMPANY
(Subsidiary of Whiting Corporation)
15673 Lathrop Ave., Harvey, (Chicago Suburb) Ill.

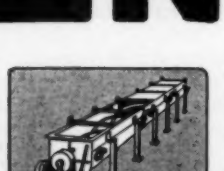
SWENSON

BASKET TYPE EVAPORATORS

VERTICAL TYPE EVAPORATORS

HORIZONTAL TUBE EVAPORATORS

ROTARY VACUUM FILTERS



CONTINUOUS CRYSTALLIZERS

YARYAN EVAPORATORS

needs increased, additional wells were installed, but even this did not long suffice, for the demands for greater quantities increased very rapidly. The centrifugal pump was developed and a number of wells were joined to a common suction of a horizontal centrifugal pump. By continuous pumping the water level in the wells was lowered to such a point that it was not practical to secure large quantities of water by this method.

As the demand increased, the velocity of the water traveling through the fine openings in the screen caused the fine sand to be carried into or against these openings and it either sand-jammed or the sand packed around the outside of the openings and closed same. In some cases, the lime in the water would combine with the sand and a concretaceous formation would set up around the screen, eventually shutting off the entire supply of water.

The development of vertical turbine pumps whereby the pump proper can be placed in the bottom of the well, connected to motor on the surface of the ground, opened up greater possibilities for greatly increased production of water from the same strata. This permitted the drilling of larger wells. The screen trouble continued, however, and the gravel wall was developed. This is the most popular method at the present time and very efficient.

In connection with Mr. Sickel's talk, there were three reels of moving pictures which showed sections and elevations, and in such a way as to demonstrate them in operation.

The Fairfield Paper Company of Baltimore, Ohio, is extending its box factory to provide space for new equipment, and also is adding 100 feet to its paper storage building. Contract for the construction, which will cost $43,000, has been awarded to the H. K. Ferguson Company of Cleveland, who prepared the plans.

MICHIGAN NEWS

At the regular monthly meeting of the directors of the Allied Paper Mills, Frank Mosteller was elected vice president and general manager of all plants. He takes office immediately. This will relieve President Alex. G. Gilman of many details and enable him to give his full time to active charge of all sales matters, connected with the King, Monarch, and Bardeen divisions, and the company's New York warehouses, from which salesmen cover the eastern territory.

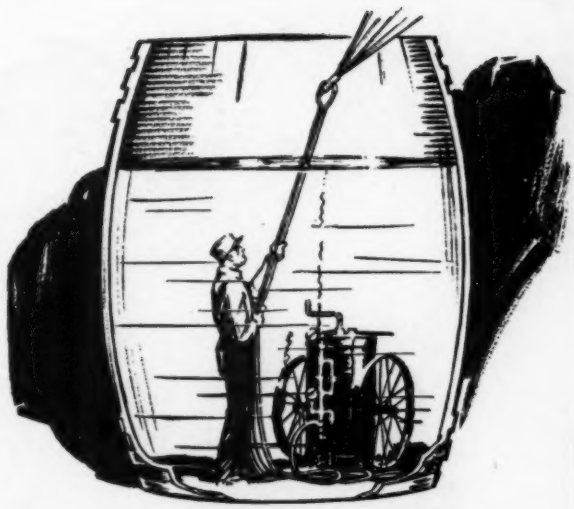
Sutherlands Seek Control of Standard

Merger of the Sutherland Paper Co. and the Standard Paper Co. into a corporation with a capitalization approximating $2,750,000 and surplus in excess of $1,000,000 is now being promoted and is virtually certain of early consummation.

This consolidation will give the succeeding corporation two mills operating four machines and with a combined daily output of 200 tons of board, together with two modern converting plants, equipped for the most efficient production of both waxed and dry folding cartons. It will place the local concern in a commanding position in the field.

The outstanding stock of the Sutherland Paper Co. is 175,000 shares of $10 par common and of the Sutherland Paper Co. 95.040 shares of like denomination. The board of directors of the former company have approved of an offer to exchange one share of Sutherland Paper Co. stock for one share of Standard Paper Co. stock. Those stockholders of the Standard who do not care to exchange stock may accept an offer of Keane, Higbie, and Company, Detroit, who will pay $25 a share for the Standard stock. Over 50 per cent of the stockholders of the Standard Paper Co. have agreed to accept the proposition.

A special meeting of the stockholders of the Sutherland Paper Company has been called to ratify the offer and increase the capital stock of the company to take care of the new stock necessary for exchange purposes.



There's Added Service in Every Barrel

NOT merely the lasting service of a superfine paint, but the preliminary service of getting the paint where you want it—on the wall.

With the purchase of Vorcolite comes the use, without cost, of our big, speedy Vortex painting equipment, that any handy man can operate and cut painting costs to the minimum.

Vorcolite is so rightly pigmented that a single application with our equipment equals two or three brush-applied coats of ordinary paint. Send today for check sheet which helps you to estimate painting on a square foot basis.

Painting Equipment is Loaned

THE VORTEX MANUFACTURING C/
1981 West 77th Street • • • Cleveland, Ohio

Vorcolite

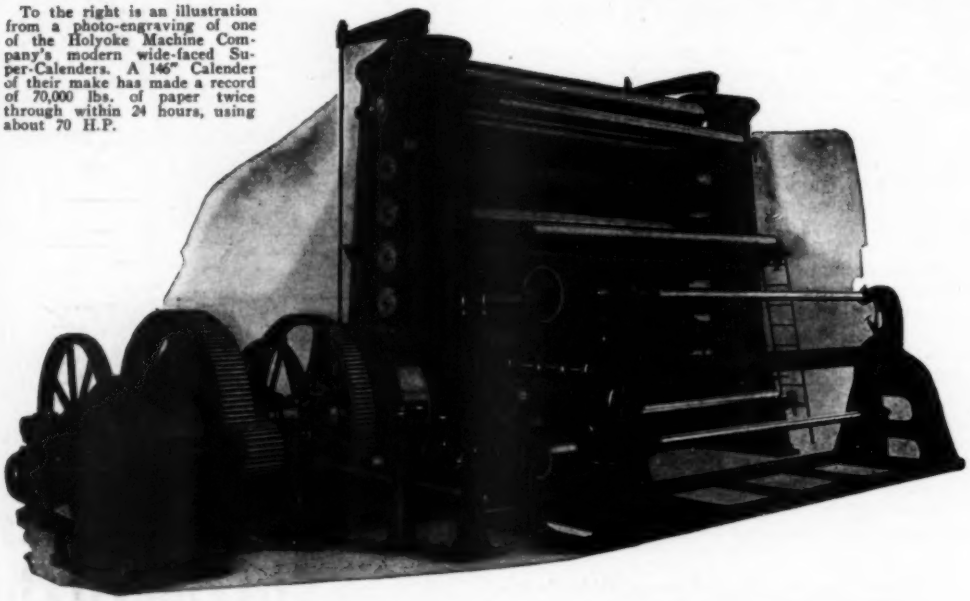
and the VORTEX PAINTING METHOD

Fill out and mail

VORTEX MFG. CO.
West 77th St., Cleveland, Ohio
Please send us check sheet to outline our painting problem. It is on new construction? _____ Buildings already in use? _____
Company _____
Address _____
Attention _____

V-27

To the right is an illustration from a photo-engraving of one of the Holyoke Machine Company's modern wide-faced Super-Calenders. A 146" Calender of their make has made a record of 70,000 lbs. of paper twice through within 24 hours, using about 70 H.P.



BUILT-TO-ORDER

By HOLYOKE

Superior Engineering Skill is part of the design and construction of every HOLYOKE machine. So much so, that while different installations may resemble one another in type, yet each machine is "Built-to-Order" in a very real sense. Special details, changes, and improvements are carefully included to meet the exact requirements of local conditions. When planning on new equipment or replacements write HOLYOKE Engineers, HOLYOKE Machine Co., HOLYOKE, Mass.

Since 1863

The print above is from a larger original wood cut of a HOLYOKE 36" Web Calender installed over fifty years ago. Constant improvements in stride with the times, plus high and unwavering standard of high quality, account for the LEADERSHIP of HOLYOKE.

Manufacturers of Super-Calenders, Platers, Cotton and Paper Rolls, Washing and Beating Engines, Wood Pulp Grinders, Barkers, Chippers, Rag and Paper Dusters, Rag Cutters, Hydraulic Pumps and Presses, Hercules Water Wheels and Governors.

The HOLYOKE MACHINE COMPANY

FOUNDED 1863

It is reported on good authority that the previous deal whereby the Sutherland firm hoped to secure control of the mill of the Western Board and Paper Co. has fallen through. Louis W. Sutherland and Frederick W. Sutherland made an offer of $20 a share for at least 66⅔ per cent of the 25,000 shares of Western Board stock outstanding. They were prepared to pay cash for this stock and Western Board stockholders were asked to deposit their respective holdings with Charles S. Campbell, president of the First National Bank and Trust Co. Their response was so delayed that the Sutherland-Standard merger was inaugurated.

As plans for the consolidation have been gradually disclosed. there has been a wild scramble for both Sutherland and Standard stocks. The former issue closed Thursday night at $26 a share on the Chicago stock exchange, while buyers are seeking Standard at $25 and none is to be had.

Saniwax Memphis Paper Plant Sold

George L. Irvine, president of Saniwax Paper Co., has just returned from Memphis, Tenn., and Dallas, Tex., and reports the sale of the Saniwax Memphis plant to Dixie Wax Paper Co., of Dallas.

The Saniwax plant at Memphis was established two years ago and enjoyed a large trade in the South. The Dixie Wax Paper Co. was the pioneer waxed paper concern in the territory and made Saniwax such a favorable offer for its Southern plant that Saniwax decided to sell.

John H. Peatling, who has been in charge of the Memphis plant, will return to Kalamazoo and again become a part of the local organization. The Kalamazoo plant will be operated on a larger scale than in the past and much of the Southern trade will be supplied from here.

The Kalamazoo Paper Box Co., East Kalamazoo Ave. and Pitcher St., is dismantling the garage next to its main factory building, preparatory to the erection of a large addition. According to E. H. Distin, vice president of the company, the size of the new structure is not as yet fully determined, nor has the contract been awarded. Plans and specifications are still being considered. The ground area available for the proposed addition is 50 by 155 feet and is located immediately west of the present plant.

Twelve years ago, the plant of the Rex Paper Co. began the production of paper. This was less than a year after the formal incorporation of the company. The founder was the late John F. King, one of the best known paper mill men in the United States, who resigned the post of vice president of the King Paper Company to form the new company. On his death, Merrill B. King, son, succeeded to the presidency. While the Rex mill is a one-machine concern it is one of the most successful in the Kalamazoo valley and has made money steadily.

Louis A. Powers, 41, of 1502 Reed Street, and Roger A. Beacon. 49, of 212 Phelps avenue, steamfitters for the Kalamazoo Paper Company, are reported to be in critical condition at the New Borgess hospital from steam burns sustained at the company plant Sunday morning, June 17th. The men were working on a line from which they supposed the steam had been shut off. When they loosened a valve, the pressure threw Powers from the platform 12 feet below where they were working, and cornered Beacon, causing him to pass through the steam and hot water to aid his companion.

The Kalamazoo Paper Box Company, located at East Kalamazoo avenue and North Pitcher street, is 22 years old this month. Rober R. Staebler, who came to Kalamazoo as directing head of the concern, still holds that position, though his title has been changed from treasurer and manager to president and general manager. The concern does a large business in the manufacture of the finer grades of boxes, employing over 100 men and women.

Dawn of the
Great Future Market
For The Paper Industry

Wall Paper, through compelling color effects and richly embossed surfaces, now wrests a gigantic market from the most energetic campaigns for painted walls. The future for box papers, utility wraps, linings and individual servers never looked brighter. BEAUTY—in everything made of paper—is the element that is building a new era for the paper industry—just as it has already done for the automobile trades. Are you preparing to get your share of this profitable market?

WALDRON MAKES
THE MACHINERY

Since 1827 Waldron has kept pace with the developments in Paper Converting. The most intricate problems in processing and production have been solved—the most original effects made possible—with machinery designed and built by Waldron.

If it is made of paper—from napkins to floor coverings—there's a Waldron machine for every step in the processing. Write for a copy of—"Converting of Light Weight Papers"—timely valuable information for men with an eye on the future.

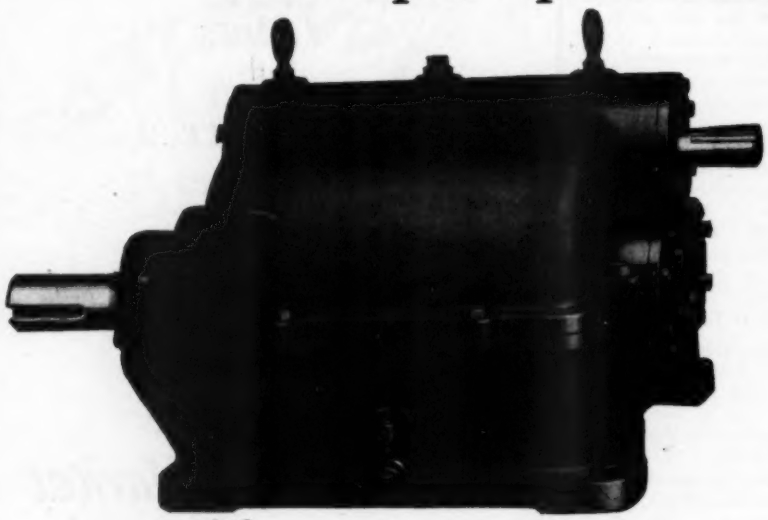
JOHN WALDRON
CORPORATION

Main Office and Works—New Brunswick, N. J.

208 W. Washington Street, CHICAGO
30 East 42nd Street NEW YORK

Address Our Nearest Office.

Heli-Spur Speed Reducer



Horsburgh & Scott Heli-Spur Speed Reducers combine the desirable qualities of the helical or the herring-bone gear with those of the spur gear to produce a rugged dependable reducer capable of carrying heavy loads smoothly and silently.

Ratios up to 600 to 1
300 H. P. Max.

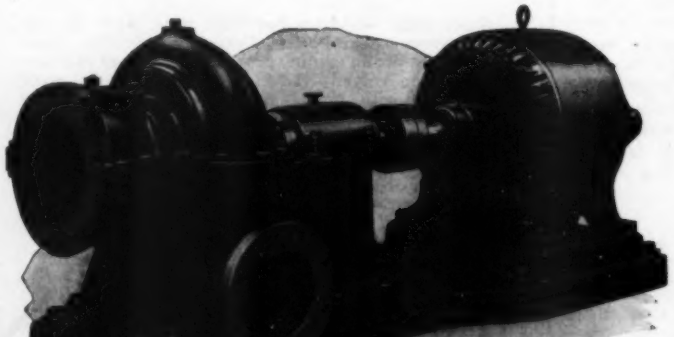
Send for new bulletin 281 and horsepower ratings

The Horsburgh & Scott Co.

5114 Hamilton Ave. *"Gear Makers Since '89"* **Cleveland, U. S. A.**

Gears for Every Industrial Purpose—Worm—Bevel—Herringbone—Spur—Spiral—Hardened Heat Treated Gears —Non Metallic Gears and Pinions

NEW DEVELOPMENTS IN PAPER STOCK PUMPING ARE OF INTEREST TO PAPER MILLS



In this connection the improved Allis-Chalmers Paper Stock Pump merits your investigation.

You can obtain from us on request, a data sheet for outlining your paper stock pumping requirement for our recommendations.

ALLIS-CHALMERS MANUFACTURING CO.

MILWAUKEE, WIS. U.S.A.

PACIFIC COAST NEWS

WASHINGTON

Plans for Vancouver Plant Announced

The Union Bag and Paper Company of New York has decided definitely to build a $200,000 plant in Vancouver, Wash., according to an announcement made late in June by W. B. DuBois of the Columbia River Paper Mills, also in that city. The plant will occupy 34,000 square feet of floor space and will be modern in all details. Plans are already prepared and bids have been called for. It is expected that construction will be completed by the first of December since the contracts are to be awarded immediately.

Paper supplies for the bag plant will be obtained from the Columbia River Paper mills in Vancouver and the Oregon Pulp and Paper Company in Salem. The plant will be a one-story structure of brick and steel construction. A wide range of paper bags including manilla and glassine will be turned out by this plant.

Tacoma Gets Hooker Electrochemical Plant

Tacoma, Wash., has been selected as the site of the western plant of the Hooker Electro-chemical Co. of New York, after several months consideration of both Tacoma and Portland, Ore. Announcement was made through E. R. Bartlett, vice-president of the company, late in June.

The plant will cost approximately $1,000,000 and will occupy a 21 acre site on the Tacoma tideflats with 1,000 feet deep water on Alexander avenue. The property is also served by the municipal belt line. Construction is to be rushed so that the plant will be completed by January, 1929. It is expected that about 150 men will be employed.

The Fidalgo Pulp Manufacturing Co. of Anacortes, Wash., has petitioned the city council for the vacation of a portion of a street adjoining the factory to be used in the expansion of the mill. Property owners in the vicinity have approved the petition and it is now in the hands of the street commitee.

Work on the San Juan Pulp Manufacturing Company's plant in Bellingham, Wash., is being rushed and it is expected that it will be completed for operation in August of this year.

Longview Fibre Co. Operating New Machine

The Longview Fibre Co., of Longview, Wash., began the operation of its new paper machine in actual commercial production the middle of last month. This huge machine, a 172-inch Yankee type fourdrinier, has a daily capacity of from 25 to 30 tons. This paper production is in addition to the heavy fiber board, the major product of the plant, which is put out at a rate of about 100 tons a day.

Six men have been sent to Longview from Wisconsin to man the new machine. They are Tony Siebers, machine boss; E. S. Umland, R. H. Gillen and H. W. Dauterman, machine tenders; and A. J. Gillen, Henry Speel, back tenders, all from the Kaukauna, Wis., mill of the Thilmany Pulp and Paper Co. A third back tender, A. P. Rasmussen, was promoted from the board machine.

The Pacific Straw Paper and Board Company of Longview, Wash., a mill that has been in operation for about two years, is to be enlarged. New equipment is to be installed, doubling the capacity of the plant and C. F. Schaub, president of the company, made a trip to San Francisco recently to make arrangements for the new equipment. Dryers are to be added to bring the plant up to capacity production.

Mike Herb was recently made superintendent of the Tumwater Paper Mills at Olympia, Wash., succeeding P. J. Vernig.

Speed Production With DAYTONS

Securing a new customer may be a tribute to the salesman, but receiving that customer's repeat order is a compliment to the product itself.

For which reason we announce that approximately 80% of the nearly 400 Dayton High Speed Beaters now "speeding production" in some seventy odd mills represents repeat business—a truly wonderful tribute to this particular product.

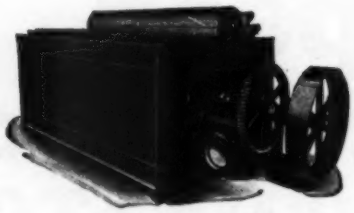
Incidentally there are more Daytons in the mills of America and Canada than the entire field of competitive high speed builders can account for—further evidence that the Dayton ACTUALLY DOES dominate.

Entirely new equipment or old type engines reconstructed.
GET THE FACTS.

The Dayton Beater & Hoist Co.,
Dayton, Ohio

E. K. Mansfield Co.,
501 5th Ave., New York, N. Y.

DAYTON
HIGH SPEED BEATERS



DECKERS

PULP OLD PAPERS

We offer a wide choice in vat design to suit every requirement. This machine in your pulp mill, as a multi-cylinder washer for old magazine or bleached stock, or the special design for handling mixed papers for Boxboard will meet your most exacting specifications.

Our long experience enables us to market these high grade machines at a very reasonable price.

Sizes: 30" x 48" up to 48" x 120"

Rogers and Special Wet Machines

The standard machine for producing high density sheet pulp for direct use or for Dryer. A low cost, simple, well proven means for reducing your labor, power and upkeep.

When dry stock is not desired the Single Press will handle the same high capacity with the same labor at still lower cost.

Built in units of 50 tons capacity or less

A. D. WOOD Thickener

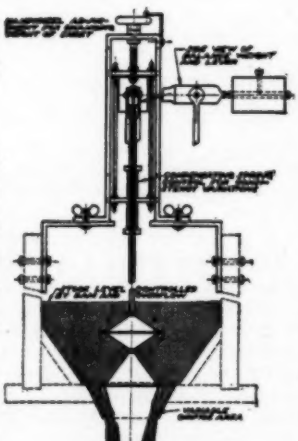
Saveall, Washer, Water Filter

The design of this popular machine is such that the cost per unit of material handled is amazingly low.

The wire does not have to drive and carry a couch roll, nor even help to discharge the thickened stock. Long life results and, with the sturdiness of the remaining parts, makes it almost automatic in operation, so seldom is any attention necessary.

Boivin Weight Regulator

Over 50% of the Boivins now operating were repeat orders.



Capable of handling any clean pulp stock in capacities above 12 tons daily, a trial of this device on our "money-back" guarantee of satisfaction will convince you that the Boivin lowers production cost and makes your customers happy. What more can you ask?

GLENS FALLS MACHINE WORKS

GLENS FALLS, NEW YORK

Waterous Ltd., Brantford, Ont. Manufacturing Agent

E. K. Mansfield Co., 501 Fifth Ave., N. Y. C.
Eastern Representative

Western Representative
Woodbury & Wheeler Co., 55 Second St., Portland, Ore.

See pages 342 and 343 in the 1927 Paper and Pulp Mill Catalogue

The Occident Pulp and Paper Mills at Edmonds, Wash., have been purchased by A. H. Dougall, for a number of years with the Paraffine Co., Inc., of the Pacific Coast. These mills were set in operation a year ago last spring and have been operated intermittently since that time. They have a capacity of 30 tons of groundwood pulp daily. Mr. Dougall and associates announced several months ago their plans for establishing a paper board mill in San Pedro, Cal.

The Shafer Box Co., of Tacoma, Wash., now constructing a sulphite pulp mill, in connection with its box lumber plant, is issuing first mortgage 6½ per cent gold bonds to the value of $400,000 for the purpose of providing additional working capital and partly paying the cost of construction to date. The net earnings of the company, from the pulp mill, will be about $120,000 per annum.

A second unit, bringing the total capacity up to 200 tons of kraft pulp daily, is to be constructed by the Zellerbach Corporation at its mills in Port Townsend, Wash. When completed, this mill be one of the largest kraft pulp and paper mills on the western coast. The first unit was begun a year ago and is expected to be set in operation this month. The second unit, it is believed, will be completed around the first of the year. J. D. Zellerbach is president of the company.

OREGON

Fir-Tex Company Announce Plans

Plans are being rapidly formed for the erection of a $2,500,000 insulating board manufacturing plant, to be known as the Fir-Tex Insulating Board Company, in St. Helens, Oregon, preliminary announcement of which was made last month. Construction of the first unit of the plant is expected to start within a very short time and will probably be completed in a year. The plant will be modern in every way, of reinforced concrete construction and the first unit covering a ground of over 2,000 feet. Equipment to be used in the plant will be practically the same as that used in pulp and paper mills.

The insulating board is a new invention of A. E. Millington and his son Carl, both well known in the pulp and paper industry. They have spent three years in research at a cost to themselves of $100,000, developing this new insulating board which can be made of any fibre-bearing wood. Slabs, edgings, limbs and the bark as well as sawdust, can be used in the manufacture of this product.

The plant is to be established where it is within reach of great quantities of raw material. As pointed out by Mr. A. E. Millington, enough raw material to manufacture 5,000,000 square feet of insulating board daily, is wasted in the mills between Portland and Astoria. The company has contracts for raw material with a number of these saw mills on the Columbia River.

H. F. McCormick of the McCormick Lumber Company in St. Helens is president, Mr. Millington is vice-president and general manager of the company and his son is engineer and general supervisor.

The organization has an authorized capital stock of 50,000 shares, of which 25,000 are grouped in Class "A" and are full common shares with a par value of $100 per share. The remaining 25,000 shares are in class "B," common voting shares without par value. The former have prior rights to dividends and after the Class "B" common stock has been paid not to exceed $7.00 per share in that year, all other dividends declared in the year, shall be divided equally between the two classes.

Mr. Millington was with the Celotex Co. of New Orleans and Florida for a number of years as production and construction engineer and for a great many years has promoted, designed, built and operated mills in the middle west.

The Oregon City Pulp and Paper Mills at Oregon City have been awarded a contract to supply the Morning Oregonian, Portland daily newspaper, with its 1929 supply of paper, which amounts to nearly $1,000,000. Williard P. Hawley, Sr., is president of the company.

LEWELLEN
Variable Speed
TRANSMISSION

YOU are paying for a LEWELLEN Variable Speed Transmission, if you have any variable speed problems in your plant. You might as well own a LEWELLEN, and reap the benefits of its economy.

One of a large number of LEWELLEN Variable Speed Transmissions, in use in the plant of Philip Carey Manufacturing Co., Lockland, Ohio, where the accurate control of speeds is highly important.

IT is costing you more, to do without the LEWELLEN Variable Speed Transmission, than it will cost you to buy it. The price of the LEWELLEN is insignificant, compared with your investment in the machinery which the LEWELLEN is intended to control. And, when you consider its long life, or low depreciation; its low up-keep; and its low operating cost, you are losing money every day you try to get along without a LEWELLEN.

Install a LEWELLEN Variable Speed Transmission now, and see how quickly it will pay for itself, by reducing wastage, and by improving the quality, and increasing the quantity of your product.

LEWELLEN
MANUFACTURING
COMPANY
COLUMBUS, INDIANA

Morey Paper Mill Supply Co.

Vulcan TRADE MARK

99 CHAUNCY St. BOSTON, MASS.

Sole Selling Agents

"LAMBETH" COTTON TRANSMISSION ROPE
and EGYPTIAN COTTON ROPE FOR SHEAHAN CARRIERS
Careful, Intelligent, Quick Service

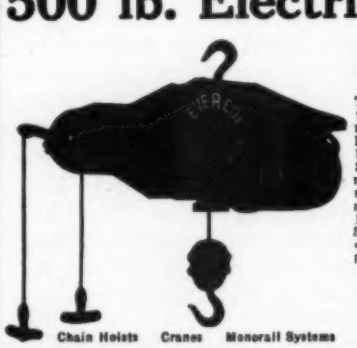
BOLTON QUALITY

JOHN W. BOLTON & SONS, INC.

EAGLE KNIFE & BAR WORKS
LAWRENCE, MASS.

The only firm making KNIVES for every machine from wood pile to finishing room.
It's the KNIVES that do the work!

500 lb. Electric Hoist



$225.00

This Everedy Hoist is the most accessible hoist made. Light — 500 lb. hoist weighs 225 lbs.; 1000 lb. hoist 250 lbs. Speedy — 40 feet per minute A. C., 35 feet per minute D. C. Limit stop at top and bottom adjustable to any point. Suspended wherever chain or air hoist is placed.

Chain Hoists Cranes Monorail Systems

READING CHAIN & BLOCK CORP.
READING, PA.

SCRANTON

Centrifugal

Steam **Triplex Plunger**
Vacuum Pumps **Jet Condensers**

Manufactured by
The Scranton Pump Co., Scranton, Pa.

PUMPS

THE WATERBURY FELT CO.

SKANEATELES FALLS
New York

FELTS and JACKETS

Top and Bottom Wet Felts for board machines, with all the qualities requisite to insure long life and continuous production.

They Satisfy

The Pacific Waste Paper Co., of Portland, Oregon, has purchased the quarter block at the northwest corner of 15th and Pettygrove Streets. The building on this property is to be occupied by the Pacific Waste Paper Co. this month. This firm was formerly located at 310 N. 13th Street.

William Harper of Albany, Oregon, has applied for a patent for a machine which he claims will remove bark and knots from pulpwood quickly and cheaply. He believes that this machine will make possible the use of lower grade woods than are now used in the manufacture of pulp. He calls his machine a pulpwood barking machine.

William Moritz, who was electrician for the Crown Willamette Paper Co. at Oregon City for the past 8 years, was fatally burned on June 28 when a flash of electricity set fire to his clothing. Mr. Moritz was 40 years of age and came to the Crown Willamette Company from Minneapolis, Minn.

BRITISH COLUMBIA

New Company to Operate Pulp Mills

The Vancouver Kraft Company, Ltd., formed to acquire and operate the Howe Sound Pulp and Paper Co. and Vancouver Kraft Mills, Ltd., in British Columbia, has been established by Fred W. Leadbetter, of Portland, and associates.

The new organization is issuing $1,250,000 worth of first mortgage 6½ per cent sinking fund gold bonds, with which new machinery and equipment will be purchased; the present mill capacity will be increased; a modern saw-mill will be installed; and a hydro-electric generating plant will be constructed in addition to a number of other minor improvements.

It is planned to begin improvements immediately, thus providing for a 110 tons of pulp daily capacity, with an estimated average output of not less than 90 tons for 300 days of each year. The plant will include a saw mill, dry kilns and planing mill with a capacity of 200,000 feet of finished lumber a day, the waste from which will supply raw material for the pulp mill at low cost. In addition, the present available lot supply is estimated to meet the mill requirements for 50 years and the company has also a reserve of 2,000 acres of timber land.

Mr. Leadbetter will have active control and management of the Vancouver Kraft Company, Ltd. He is also president of the Columbia Paper Company which includes the Columbia River Pulp and Paper mills at Vancouver, Washington; the Oregon Pulp and Paper mills at Salem, Oregon, and the California-Oregon Paper Mills at Los Angeles, Cal. Headquarters are at the Oregonian Bldg., Portland.

The mill site of the Vancouver Kraft Company, Ltd., is at Port Mellon, B. C., on Howe Sound, about 25 miles north of Vancouver, B. C., and covers 73 acres of land, having a deep water frontage of approximately one-half mile. The property also includes, in addition to the plant, warehouses, docks and other facilities suitable for loading of ocean-going vessels at all tides. The plant was constructed in 1912 and has been expanded and improved until its present capacity is 40 tons of pulp daily. With the installation of the new machinery and equipment, the maximum capacity of the mill will be 110 tons of pulp daily.

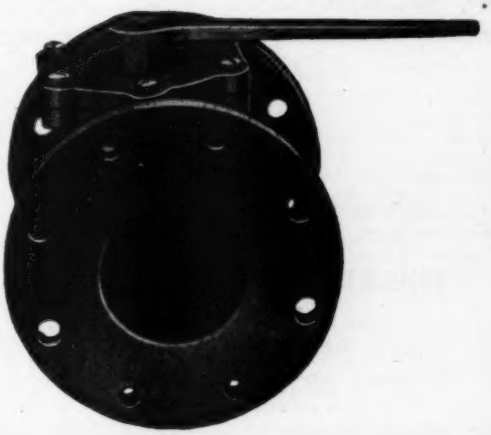
Blake, Moffitt & Towne Acquire Mutual Paper Co.

Blake, Moffitt and Towne, pioneer paper jobbing firm of the Pacific Coast, has purchased the Mutual Paper Co. of Seattle, Wash. A new corporation is being formed to take over the Seattle firm's business. This company has been in the paper trade in Seattle more than 20 years.

Officers of the new corporation are to be: President, O. W. Mielke; vice-president, J. W. Thompson; secretary-treasurer, E. H. Pope; sales manager, James C. Whitelaw. Mr. Mielke is president of the Blake, Moffitt and Towne and Mr. Thompson and Mr. Pope have been officers in the Mutual company.

Divisions of Blake, Moffitt and Towne, which was established in San Francisco in 1855, are located in Portland and

"Repeat Orders Are the Best Indorsement"



Built for Your Purpose!

THE Barker Quick Opening Stock Valve meets all the requirements you place on it—with features which all mill men have been seeking.

Simplicity and strength are both present. This valve is built on an entirely different principle from other gate valves, in that a straight bronze plug is used instead of a gate, with a cast-iron body designed to reduce plugging to a minimum. Has no bonnet to leak. Valve is furnished with a long handle to open and close, with sufficient leverage to shear off ordinary obstruction without using a piece of pipe. Valves may be placed in any position.

The Barker Quick Opening Stock valve **does not require cleaning** after each different color or grade of stock has passed through. The many repeat orders being received by us are the best proof of satisfaction.

Install this valve and note the difference.

GREEN BAY BARKER
Machine & Tool Works
Green Bay Wisconsin
"Machinery Manufacturers"

FOR SALE

One excellent 90" trim Rice, Barton and Fales Paper Machine complete with Marshall Drive; three 10 plate screens, wire 60' x 106"; two sets Presses; 24-48" diameter Dryers; two Stacks Calenders; Reel; Winder —complete in A-1 condition. Immediate delivery. Also Brownell Variable Speed Engine with Paper Machine. Also three 2,000 lb. Jones Cypress Wood Tub Beaters. Good condition. Full details and photographs upon request. All at very reasonable price.

GIBBS-BROWER COMPANY, INC.

Paper and Pulp Mill Brokers

261 Broadway, New York City
186 West Jackson St., Chicago, Illinois
1816 Engineers Bank Building, Cleveland, Ohio
Woodbury & Wheeler Co., Western Representatives
55 Second St., Portland, Oregon
OUR MOTTO—"Service First."

FOR SALE—One slightly used Noble & Wood Mammoth Jordan together with 500 HP motor and coupling. It is also equipped with pulley for belt drive, if preferred. Price and particulars upon request. The Noble & Wood Machine Co., Hoosick Falls, N. Y.

WANTED—Mechanical Engineer with five years experience as Master Mechanic of pulp and paper mill or large chemical plant. Must have successfully handled crew of 150 men of various trades. Age between 35 and 40 years. Give salary expected, full details of experience and references in first letter. Address Box 138, The Paper Industry.

It Pays to Advertise Opportunities in this Opportunity Section

POWER PLANT PIPING

We are fully equipped to supply fabricated materials and to install complete piping systems for Electric Power Stations, Blast Furnaces, Steel Mills, Coke Works, Paper Mills and Industrial Plants of every description—backed by an experience of almost a quarter century.

Pittsburgh Piping & Equipment Co.

PITTSBURGH, PA.

Steel Plate Construction

Steel Storage Tanks, Blast Furnaces, Gas Holders
Steel River Barges and Plate Work of all Kinds
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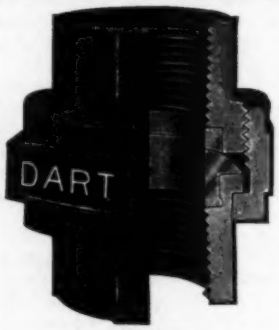

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BRITISH CORRESPONDENCE

News of the Industry

In order to increase further the demand for good-class writing papers, the Employers' Federation of Envelope Makers and Manufacturing Stationers is holding an exhibition of stationery in London for the purpose of emphasizing the value of good quality paper in business and private correspondence. The present relatively satisfactory condition of this section of the trade is attributed to the up-to-date publicity methods employed by merchants and other consumers, and it is intended that this exhibition shall amplify their efforts in this direction.

The demand for art and imitation art papers continues satisfactory. On the newsprint side, manufacturers are still fighting keen competition, and they are especially feeling the Canadian competition in foreign markets. The fact that British exports to Australia during the period January-April 1928 declined 129,317 hundredweight, as compared with the corresponding period a year ago is conclusive proof of Canada's gain.

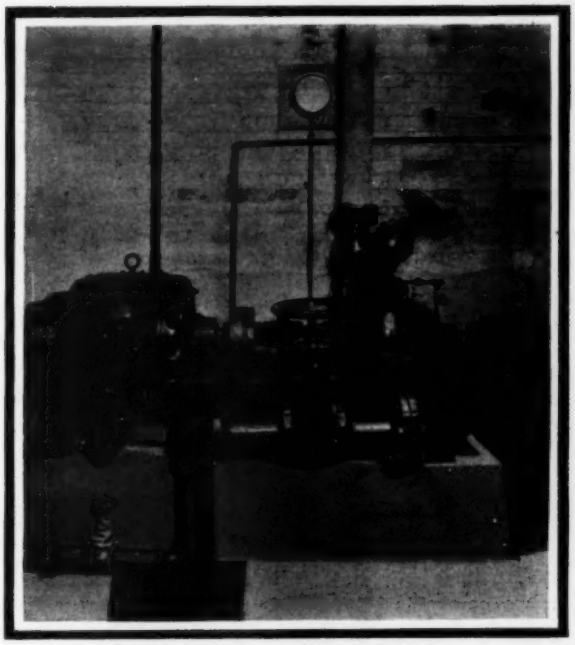
There was a marked decline in the imports of wrapping and packing papers during April, amounting to 77,000 hundredweight, as compared with a year ago. On the other hand, British exports have improved, though not to a very great extent. The esparto section of the industry is reported to be in a comfortable position. Demand is regular and prices remain firm. The position in the wood-free section is also steady.

An interesting development in the paper-making industry of this country is the proposed production of viscose transparent paper. The market in Great Britain for such paper has hitherto been held by French and German manufacturers, and if British makers can produce and sell at competitive prices, it is hoped that British consumers will support this project. In view of the large consumption of such paper for wrapping various commodities, particularly foodstuffs, there should be a valuable market.

Mr. William Harrison, the chairman of the Inveresk Paper Mills Co., and, as such, the head of one of the most comprehensive combines connected with the paper, publishing, and printing industries, to be found anywhere in the world, is now giving serious thought to the possibilities of making wood-pulp in this country. It is interesting to recall, in this connection, that, some thirty years ago, when the making of wood-pulp and of paper from wood-pulp was not such an exact science as it is today, an attempt was made in the north of England to import the timber and turn it into wood-pulp for papermaking; but it was not a success, and no further attempts have been made since. Mr. Harrison only entered the paper industry a few years ago, and, to judge from his achievements in the many branches of the trade now under his control, there seems to be every reason why this new venture should be a success.

It has already been proved that vegetable parchments can be made in this country, for, in spite of the skepticism of the experts, a mill at Northfleet is now turning out nearly as much of this class of paper as the average total imports of the past few years, and of a quality which experts say is quite equal to the best that comes from abroad. When the Inveresk Paper Co. purchased the big German pulp, paper, and chemical mills of the Koholyt Co., skilled British workers were sent across to learn the methods so that a similar industry could be started in this country.

The proposed site of the new British sulphate mills is upon the east coast of Scotland. This position has been chosen because the three necessities for manufacture are near at hand. Coal is immediately available from a near-by source, there is a sufficient supply of water, and the chemicals are easily obtained. Only the timber will have to be imported. Inquiry has proved that the tonnage for the transport of



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timber and coal is much the same, so that there is not much difference between the importation of coal and chemicals, and the use of her own wood supplies by Scandinavia, on the one hand, and the importation of timber and the use of their own coal and chemicals by British manufactures on the other.

Experts now point out that, although, when the scheme for the manufacture of woodpulp was first mooted, it was considered a wild notion, analysis of the situation now shows that it is not unreasonable to expect such a development. and it is now realized that much of the opposition to the scheme emanated from those whose financial interests were centered either in the manufacture of wood-pulp and paper in foreign countries, or in its importation into Great Britain. It might not be an economic proposition to produce wood-pulp in existing paper mills, but with new mills specially equipped to produce and supply wood-pulp, the matter takes on an entirely different complexion.

There still exists a need for much closer co-operation between papermakers and consumers in this country; the main bar to it, however, is the feeling of suspicion and distrust which exists between the papermakers and merchants. The latter want to keep to themselves what business connections they have made, and are afraid that if the makers and consumers get together, much of the business the merchants at present hold may drift into other hands. It has been pointed out that the merchants' representatives are salesmen only and not paper experts and have little practical knowledge of the goods they handle. These salesmen are considered to be responsible for the keen price-cuting that during the last few years has been the curse of the trade. for with their lack of practical and technical knowledge of paper, and their ignorance of the intricacies and technicalities of the business, they seldom have any other argument to put forward to prospective customers than that of price.

On the other hand, it cannot be disputed that many of these merchants understand the needs of the printer, whereas very few papermakers understand the technicalities of the printing trade, and few printers have an exact knowledge of the making of paper. This lack of co-operation and ignorance of each other's needs and difficulties has caused the accumulation of a multitude of grades and substances and varieties that are quite unnecessary, and there is an enormous number of grades on the market which are nearly identical and yet sufficiently different not to match. One authority in the paper trade has given it as his opinion that "A friendly conference between producers and consumers, and a little more opportunity for the former to study the real needs of the latter would do incalculable good."

Import and Export Figures

Below are set out the values of imports and exports for the paper trade in May, together with the increases or decreases as compared with the corresponding month of the two preceding years:—

IMPORTS.	May, 1928.	Increase (+) or Decrease (—) as compared with 1927.	as compared with 1926.
Paper-making Materials..	885,860	—421.599	—144,126
Paper and Cardboard....	1,474,082	+189,244	+565,616

Quantities of the same articles imported:

	May, 1926.	May, 1927.	May, 1928.
Wood pulp, tons.....	102,979	128,006	97,274
Paper, cwt.	920,245	1,331,288	1,614,704

EXPORTS.	May, 1928.	Increase (+) or Decrease (—) as compared with 1927.	as compared with 1926.
Paper-making Materials..	133,852	—225	+36,924
Paper and Cardboard....	844,594	+85,580	+166,821

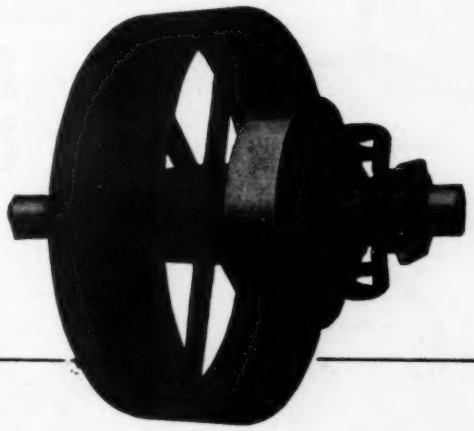
Quantities of the same materials exported:

	May, 1926.	May, 1927.	May, 1928.
Paper-making Materials, tons	9,703	16,876	18,343
Paper and Cardboard, cwt.	355,164	379,567	436,765

Seaman Paper Co., 411 West Ontario St., Chicago, Ill., has been appointed agent for the American Writing Paper Co., Holyoke, Mass.

The office of Pulp Bleaching Corp., has been moved to 200 Fifth Ave., New York City.

Save Power and You Save Money



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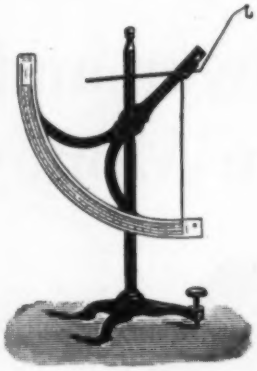
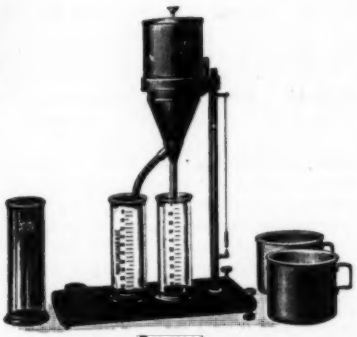


All Kinds of Scales



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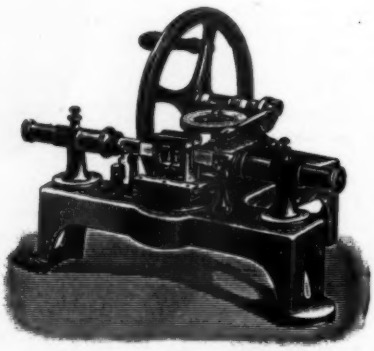
Uniformity of beating means better paper.

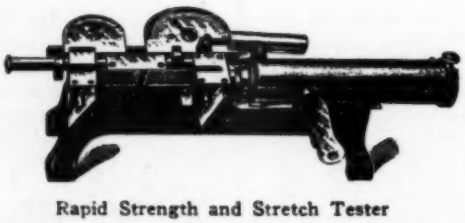
The Schopper Standard Desk Micrometer
Carried in stock—1/1000 of an inch for Boards, 1/2000 of an inch for Paper.



Schopper Folding Tester
The folding test has become standard for bonds, ledgers, and Kraft papers.

Schopper Strength and Stretch Tester

Small Piece Pocket Paper Scale
By weighing a piece 2 in. by 4 in., gives basis weight 25x38, 24x36, 22x34, 500 sheets.



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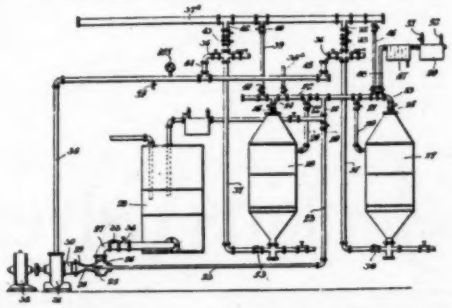
Technical Developments in the Paper Industry

Domestic and Foreign

The following abstracts are of the latest developments found in the foreign press and the domestic and foreign patent offices. Photostats and translations of complete articles and patents can be obtained at cost price.

Acid Proportioning and Control System for Sulphite Mills

THE acid proportioning and control system is applied to an installation of several digesters. A cooking liquor storage tank and an acid filling pump are also part of the equipment. Conduits controlled by valves are connected to



the digesters for filling and discharging purposes. One pipe is arranged so that it is common to all the digesters and this pipe is provided with a controlling valve. It also carries an ejector and communicates with the storage tank and the filling pump as well. A pipe also connects the ejector with the control valve mentioned above. C. O. Sisler, Sault Ste. Marie, Ontario, Canada. United States Patent No. 1,671,656.

Penetration of Digestion Liquor Through Pine Wood

THE investigation was carried out along two distinct lines, first to determine how much of the liquor is absorbed by the wood, and second to determine how the constituents of the liquor are absorbed by the separate zones of the piece of wood. Wood chips, 4x4x5 centimeters, were used and were subjected to the action of sodium bisulphite solution and also to magnesium bisulphite solution. Wood with a slight water content was used in the first experiment and with a high water content in the magnesium bisulphite experiment.

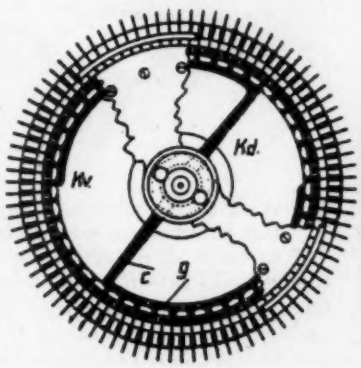
It was found that the action of sodium sulphite on wood is very slow, and for this reason it is necessary to pay very careful attention to the penetration period in the digestion process. All the investigations were carried out in a very systematic manner. Thus, comparative experiments on penetration were made with the aid of the sulphites, bisulphites and bisulphites plus excess sulphur dioxide of the elements, sodium, magnesium and calcium at temperatures which varied from 40 to 70 degrees C. These experiments showed that the free sulphur dioxide, which exists over the bisulphite liquor, is of particularly determinative importance in securing a proper penetration of the digestion liquor through the wood chips. While magnesium sulphite, calcium bisulphite and magnesium bisulphite liquors, and also calcium bisulphite and magnesium bisulphite liquors with the excess sulphur dioxide are absorbed in its original composition by pine wood, nevertheless, selective absorption takes place when digestion liquors are employed in which sodium is the base. When these sodium liquors are employed for digestion purposes, the degree of penetration of the liquor at temperatures which vary between 40 and 70 degrees C. can be analytically determined in those wood chips which are most suitable for this purpose. The results indicated that the outer layers of the wood absorbed the digestion liquor in its original composition, that is all the ingredients of the liquor were absorbed. On the other hand the inner layers of wood fibers seemed to contain only free sulphur dioxide when the penetrating liquor was composed of sodium bisulphite and sodium bisulphite plus excess sulphur dioxide. When sodium sulphite solutions were used, it was also found that free sulphur dioxide was present within the interior of the wood chips. Dr. Carl Schwalbe and Dr. W. Lange, Der Papierfabrikant, year 1928, number 16, pages 238-240.

Making Paper Insulating to Electricity

IN ORDER to make paper resistant to the flow of electricity, heat, a fiber pulp is incorporated with a kelp product and is formed into a paper web. The kelp is preferably solubilized, for example, by digestion with caustic soda or other alkali, and is precipitated after admixture with the fiber pulp by a solution of a metallic salt such as zinc sulphate or calcium acetate. Alternatively lime or a mineral acid may be used. If desired, a binder such as rubber and an inert filler may be added prior to precipitation. The proportions of the constituents used in two examples are given. A. L. Kennedy, Keene, N. H., assignor, Plastic, Inc. British Patent No. 287,538.

Beater Roll

THE beater roll, which is shown in the accompanying illustration, is hollow. The body of the roll (c) is provided with driving shaft and knives. In its interior it is also provided with openings (g) for the flow of air and the mixture of water and stock. Thus the flnids penetrate into the interior of the roll and into the vacuum and pressure chambers (Kv) and (Kd). These chambers are rotatable around the interior of the roll. Hence the stock, which is being beaten in the beater, is subjected to a suction effect in the vicinity of the vacuum chambers, while within the range of action of the pressure chambers it is subjected to a pressure action which removes it from the interstices between the knives on the roll. Wilhelm Gruetzky, Erkrath, near Duesseldorf, Germany. German Patent No. 457,407.



Straining Pulp

BRITISH Patent No. 286, 814, granted to D. Russell and J. R. Happer, England, is concerned with straining machines which are provided with elements consisting of moving bars. A train of rods in the form of rollers carrying spaced discs at their ends pass down an inclined pair of rails under gravity. The movement of the rods is regulated by an escapement device, a straining bed being formed which

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SCALE FORMATION, the bugaboo of interior dash pot valves, will never cause this Davis Stop and Check Valve to stick. The dash pot is outside of the body of the valve! Never coming in contact with the steam, this oil dash pot will always be free of the binding scale formation that causes other valves to stick. This perfection of design, together with the sturdy construction characteristic of all Davis Valve Specialties, is absolute assurance against a reversal of steam flow from the boilers.

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Checks Valve Costs

Fig. 295, flanged, Jenkins Standard Iron Body Swing Check Valve finds many applications in paper mills, particularly on lines carrying heavy liquids or solids in suspension.

For lines in beater and machine rooms—where flow should be straightway and metal must resist corrosion—Jenkins Iron Body Swing Check Valves are more and more specified. Jenkins Valves have a sustained reputation for checking valve costs.
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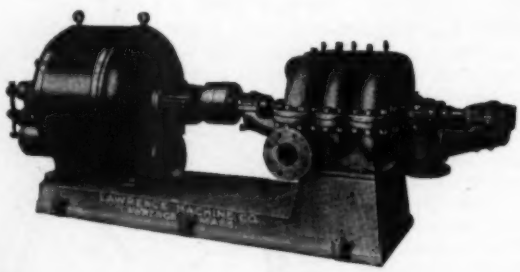

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but predominant in quality

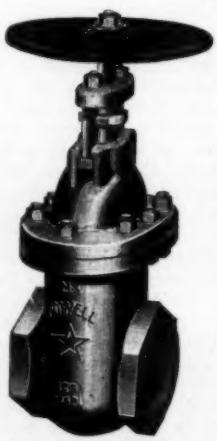

Fig. 1430—S.E. N.R.S. Gate Valve

Our New Standard Iron Body Gate Valves—although new in design—are made to the usual Powell quality.

This high standard of construction has produced in these iron body gate valves the maximum in rugged strength, and serviceability, the fullest interchangeability of parts, and a perceptible reduction in repair and replacement in service.

We manufacture a complete line of bronze, iron and steel, globe, angle, gate and check valves; also oilers, lubricators, grease cups, water and oil gauges, etc.

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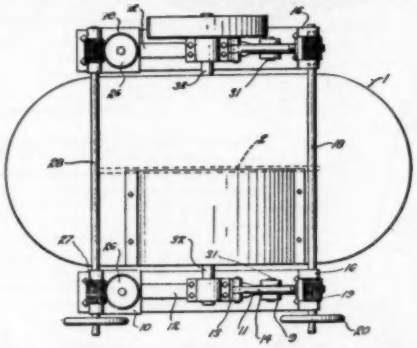
Powell Valves

receives pulp from a stuff box, which is located at the top of the traveling device. The strained pulp is allowed to enter the collecting trough. Below a driving device or wheel, which is located at the end of the traveling device, the rods separate and the rejected material falls into a box. The rods are returned to the upper end by means of a conveyer. The inclination of the rails can be adjusted by means of a screw-jack which turns the supporting frame about a pivot.

Beater

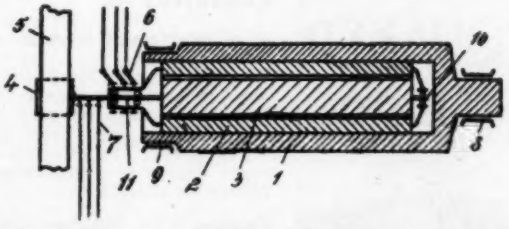
A CONCAVE body is fixedly mounted in the trough of the beater (1). The concave body is provided with a backfall. The body is provided with blades which extend



transversely of the concave and are arranged in a series extending from the top to the bottom of the concave. A cylinder is mounted for rotation (seen at 2). Separate means are provided for adjusting the cylinder horizontally and upwardly and downwardly relative to the concave. J. S. Beck, Manville, N. J. United States Patent No. 1,670,183.

Electrical Unit Drive for Rolls with Changeable Axial Height

GERMAN Patent No. 457,846 is concerned with rolls used in paper calenders. Most of the paper calender rolls are driven in such a manner that the middle roll is acuated by an electric motor either by means of a belt or driving gears. The other rolls are diven by friction, whether located above or underneath the middle roll. Due to the wear and tear on the rolls brought about by this system of drive, the upper rolls sink in the movable bearings until they rest once again on the lower roll. The change in the axiel height of the driven roll must consequently be taken into consideration in the operation of the calenders to obtain a certain calendering effect in the paper. When the belt drive is employed, then this change is simply adjusted for by taking in or let-



ting out the tension on the belt. But the belt drive is both uneconomical and disadvantageous and the calender is preferably driven by means of an individual motor and gearing. Hence, special devices must be provided under these conditions to maintain the drive vertical, for the coupling between the driven roll and the gearing connot stand any great difference in the position of the axes. Such arrangements are however cumbersome.

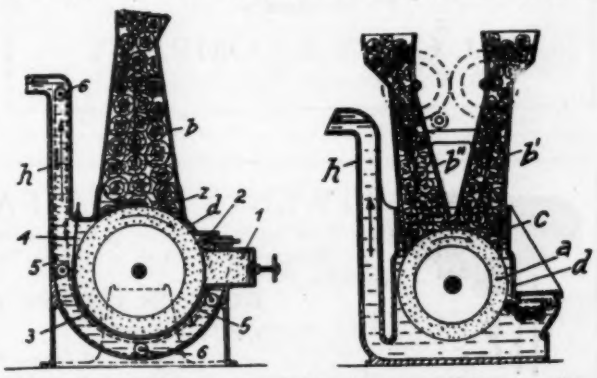
The new invention avoids a special adjustment of the driving gear by making the roll itself carry the drive, connected with the roll through driving parts. Hence when the driven roll is lifted or lowered, the driving mechanism is carried along with it. In order to avoid the roll and drive rotating freely in space, a portion of the drive is prevented from rotating by a guide stick movable in a vertical carriage, The electric characteristics of the motor can be chosen to conform to electrical condition in the plant.

Calender rolls require a comparatively small angular speed. The motors must therefore be wound for a large number of poles. Under such conditions the motors would be very large and their location on the driving roll would be a rather difficult task. A reducing gear is thus inserted between the motor and the driven roll.

The rotating primary element (2) of a multiphase current motor is built into the roll (1), as may be seen from the accompanying illustration, which indicates one way of carrying out this process. The inner secondary element (3) is connected with the sliding piece (4) which can be moved along the slide rail (5) and thus this element may be effectively prevented from rotating. The current is let to the part (2), that is the rotor, through the slip rings (6) arranged around the shaft outside of the roll (1), while the secondary circuit is closed to the bus bars (7). The secondary element (3), which is non-rotatable, is held in the bearings (10) and (11). The rolls are actuated by the motor through the vertically movable bearings (8) and (9), while their weight is carried by the lower rolls during the operation of the calender. Siemens-Schuckertwerke A. G., Berlin-Siemanstadt, Germany. German Patent No. 457,846.

Improved Grinders

THE grinder that is seen in Fig. 1 is of the automatic feed type and contains just a single feed box (b). The box, also called pressure box, is solidly connected with the housing (d) of the grinder. In addition to the regular grindstone (a), there is also provided an auxiliary and adjustable



stone (1), which serves to grind up in proper fashion bundles of fibers and slivers. The sharpening roller (2) is located above the auxiliary grindstone (1). A screen (3) surrounds the grindstone (a), and this may be moved back and forth with respect to the grindstone by means of the screws (4). In order that the stock does not settle, a rotating agitating belt (5) is arranged through the entire grinder housing (d) and the riser pipe (h). This belt is carried over the rollers (6). The belt is provided with scrapers which continuously clean the screen from the outside. Figure 2 shows the grinder which is made with two pressure chambers in the place of one. Der Papierfabrikant, 1928, pages 253 to 256.

New Method of Utilizing Waste Liquors

A SWEDISH engineer, W. Muentzing, has been working for several years on the task of isolating a portion of the lignin substance dissolved in the waste liquor before the liquor is evaporated. Thus sulphite waste liquor was mixed with sulphate liquor (black liquor) in a cartain ratio, so that the former predominates, and the mixture was subjected to a temperature of 110 degrees C under pressure. The soapy and incrustating substances from the two waste liquors are thus precipitated in easily separable form. Decantation or filtering may be employed to remove these precipitates. The disagreeably smelling methyl mercaptan is converted into a considerably less unpleasant smelling substance. The sulphuretted hydrogen, which is formed by mixing the waste

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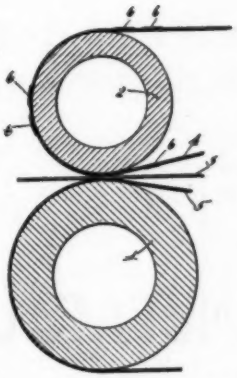
liquors, must be removed before the liquor, which is recovered from filtration, is further processed, so that the gas does not have a chance to exert its disturbing action on the fermentation of the liquor to alcohol.

The precipitate may be employed either alone or in common with the evaporated waste liquor as a fuel, after the two masses are formed together into briquettes. The ash that remains after combustion may be lixiviated to extract the alkali and this can be caustizied with the aid of milk of lime. Besides, the portion of lime, which was contained in the sulphite waste liquor, is recovered and the alkali loss, which cannot be avoided in the alkali regeneration process, is thus reduced. Instead of using the aforementioned precipitate as fuel, as has been described above, it can be mixed with the evaporated waste liquor and the mixture is then subjected to dry distillation. A final coke-like product is secured, from which an ash is recovered after combustion. The ash can then be treated again for recovery of alkali. Wochenblatt fuer Papierfabrikation, year 1928, number 15, page 403.

Marking and Finishing Paper



A FABRIC finish is imparted to paper by means of the apparatus which is seen in the accompanying illustration. The process consists in subjecting the paper interposed between fabric layers together with a marking element to heavy pressure between rolls. At the same time, a slight slip is effected between the paper and the fabric. S. W. Webb, Brookline, Mass., and A. Allen, Bangor, Me., assignors, Eastern Manufacturing Co., Boston, Mass. United States Patent No. 1,669,885.

Water Requirements and Fiber Loss in Pulp Mill

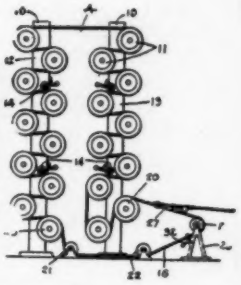
AN INTERESTING account is given by S. Flotijew, in Bumaschnaja Promischlennost, volume 7, year 1928, pages 145ff, of the water requirements and loss of fiber values in the separation and dehydration operations in a Russian pulp mill, which works on the principle of reusing the fresh water after it has passed through the pulp making operations. The method used is as follows. The stock passes to the separator from the stock pit and after being processed in the former apparatus it is mixed with fresh water and partly with used water. The mass of stock then passes through the knot catchers, sand catcher, centrifugal screens and finally reaches the dehydrating press. The back water from this press is used over again in the process. The results of the process are as follows:

Per ton (metric) of air dried pulp 300 cubic meters of fresh and 250 cubic meters of used water were used. Standard practice indicates that under similar conditions the consumption of fresh water should be 380 cubic meters and of used water only 150 cubic meters per ton of pulp produced. The stock was too strongly diluted in the knot catchers and the sand catcher and the ratio of stock to water was accordingly one to 400 instead of one to 300 as is customary. The fiber loss in the drum screens was high, being 4.6 to 6 per cent. In another mill this loss was only one to one and one-half per cent.

Sizing Paper

AS A preliminary to being compacted by pressure, paper stock or other fibers are treated by adding water, tannic acid and a soluble metallic soap. The fibers are then beaten and the soap precipitated on to the fiber by means of a metallic salt. The preferred proportion of tannic acid is about twenty per cent by weight of the weight of the soap. In an example, one thousand pounds of waste paper are beaten with 110 to 130 pounds of soap prepared from linseed oil, china wood oil or rosin and from ten to twenty per cent of its weight of tannic acid. After beating, the soap is precipitated by the addition of 45 to 55 pounds of sulphate of alumina. Agasote Millboard Co., Ewing, N. J. British Patent No. 286,948.

Threader for Paper Drying Machine



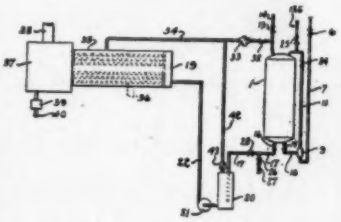
THE threader consists of an endless tape which is wound around the dryer rolls of a drying machine. A leader is provided to which the leading end of a paper web to be dried is attached. This leader may be attached to the tape in such a manner that it can be easily removed. L. M. Avenson. St. Paul, Minn. United tates Patent No. 1,670,873.

Working Up Old Paper

THE old paper, just as is comes into the plant, is filled into the beater, without preliminary sorting and the mass is slightly heated with steam if that is necessary, exhaust steam being used for this purpose. In order to protect the beater roll, hard wood posts are placed just in front of the roll and these posts are connected with wire fencing. This arrangement effectively protects the beater roll from stone, pieces of iron and the like which are found in the old paper and which could injure the roll if they came into contact with it. This protective screen is of great importance and when it is used it has been found that the knives of the beater roll remain in good condition indefinitely. The beating of the paper mass in the beater is completed with one to one and one half hours and then the contents are emptied into a collecting tank. Before the stock passes to the papermaking machine, it must go through a large sand catcher, which is provided with bracing rods on which a wire netting is again fastened for the purpose of holding back entanglements of stock floating on the surface of the liquid. Successful results have been obtained with this arrangement for a period of years. E. Liebeherr, Wochenblatt fuer Papierfabrikation, year 1928, pages 399 to 340.

Cooking Wood to Obtain Chemical Pulp

THE wood is cooked with the aid of steam and a chemical liquor in a digester and after the digestion has been completed the spent liquor is withdrawn and immediately and while the liquor is still at a high temperature it is subjected to a vacuum in order to evaporate and concentrate it. The liquor is also heated with the steam that is withdrawn from the digester, the steam being passed through coils contained in the evaporator and thus its heat is utilized for concentrating the liquor. The digester is seen at (1) in the accompanying illustration and the evaporator is shown at (35). The heating coils within the evaporator are indicated at (36). The pump which circulates the liquor is shown at (21). Various piping connections between the several parts of the installation are also indicated. W. H. Howell, Willsboro, N. Y. United States Patent No. 1,670,156.



Art Paper

A PAPER of high gloss and a pure white color, suitable for art printing papers, chrome cartons, substitute papers, and the like is obtained by adding to the pulp a paste consisting of saponified stearine to which is added a heavy metallic salt, preferably a zinc salt. Thus ten parts of stearin are saponified with twenty to twenty five parts of caustic potash or caustic soda. To this two hundred pounds of a given per cent solution of zinc sulphate are added and the necessary quantity of potassium or sodium silicate

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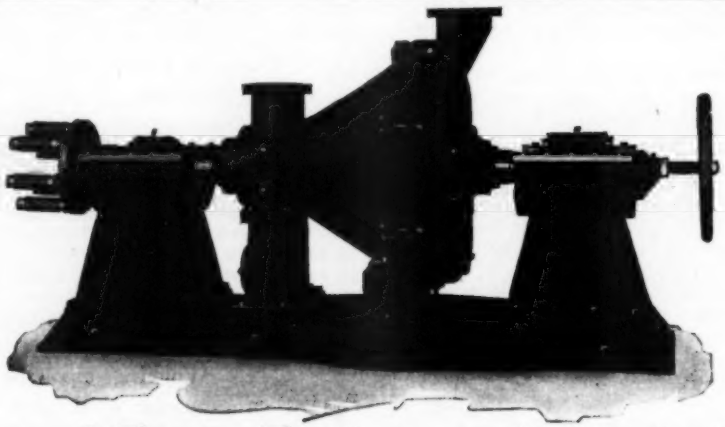

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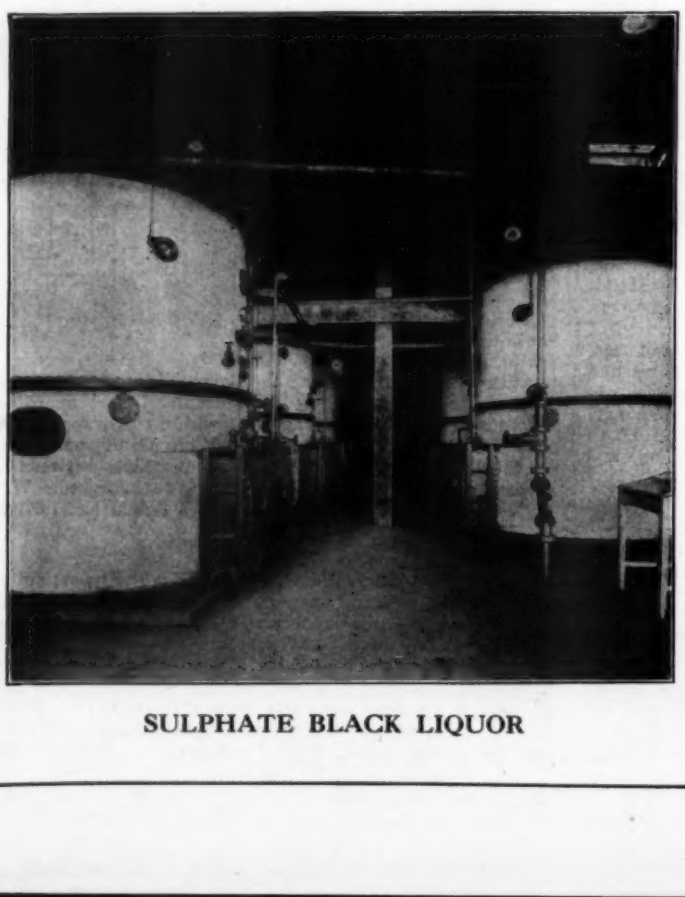

SULPHATE BLACK LIQUOR

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EVAPORATORS

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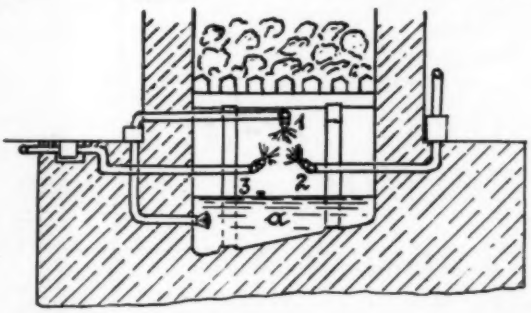
to obtain a substance of marketable consistency. Sieben-Hirtner Chemische Industrie Wer Gesellschaft, Vienna, Austria. British Patent No. 287,559.

Making Potassium Sulphite Liquor

THE calcium sulphite liquor, used in the manufacture of pulp, must have a concentration of five degrees Be. sulphurous acid. Up to the present time, the preparation of the calcium sulphite liquor has been carried out in two towers which are filled with broken limestone. At the upper end of the first tower, water is allowed to flow into and trickle down over the broken stone, which dissolves out particles of lime as it flows down to the foot of the tower. The sulphur dioxide gases, which are introduced into the tower at its foot, combine with the lime water flowing down and forms calcium sulphite liquor. If now the liquor contains less than five degrees sulphurous acid, which is determined by measurement, then the liquor formed in the first tower is pumped to the upper end of the second tower, and the process which took place in the first tower is then repeated in the second tower.

A process has been known, according to which bisulphite liquor of the required concentration can be prepared in one tower. The liquor, which is obtained by one passage of the water through the tower and which is still too weak, is lifted by a pump to the top of the same tower and is concentrated by being allowed to flow down the tower again and being subjected to contact with a current of sulphur dioxide gas.



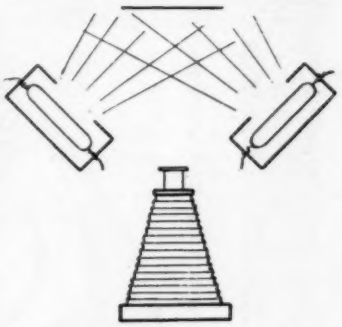
In contradistinction to the known processes, the technical feature of the new process consists in producing a bisulphite liquor of the proper degree of concentration by just a single passage of the water through the tower. In this it is not necessary to circulate partially concentrated liquor through the tower and hence a saving is effected in cost of operation.

The liquor, which contains less than five degrees Be. Sulphurous acid, collects in the space (a) (see the accompanying illustration). Three pressure nozzles, (1), (2), and (3) are located over the liquor in this space, and they are arranged so that they form a triangle, as may be seen. These nozzles emit diluted calcium sulphite containing liquor, water and sulphur dioxide gas according to the pressure. The pipes that lead to these nozzles are pressure pipes and are connected with a pressure pump. Richard Boehlig, Frankfurt am Main, Germany. German Patent No. 455,681.

Bleaching Sulphite Pulp

THE advantages and the attainable chlorine savings in bleaching stock of high density are described in brief. The results are compared with a combined chlorine liquor-hypochlorite bleach. It was determined that an extraordinary purity of color is obtained in the latter case and the saving in chlorine is approximately thirty per cent. Furthermore, the bleached pulp that is obtained under these conditions possesses a remarkable purity from the chemical standpoint. The theoretical and practical bases for bleaching with hypochlorite liquor both in high and low stock density as well as with chlorine water and mild alkaline extraction of the chlorinated incrustations on the pulp are described in considerable detail. The varied fluorescence of the bleached stock in ultra-violet light and its relation with the degree of purity is determined and is employed for practical comparative purposes.

The question of whether to use a high or a low stock density in the bleaching operation is discussed from several standpoints, as increase in the speed of reaction and cold bleach, better utilization of space in the bleacher and reduced consumption of energy, better quality of bleached pulp and its relation to saving in chlorine are all discussed.

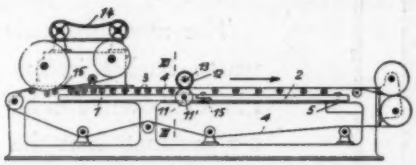


A series of experiments was made in which the pulp was first treated with alkali, sodium hydroxide solution, before being bleached. The results indicated that more oxidizable materials were removed by the alkali than by the action of chloride of lime. The same results are obtained both in the cold and wet extraction. The addition of hypochlorites in the extraction is not absolutely necessary. The same results are obtained with lime hydrate as with sodium hydroxide. The chemical properties of the pulp which is bleached in accordance with this method, which consists first of alkali treatment, then of preliminary bleaching and finally of after-bleaching, are very well comparable with those obtained in the normal two-stage bleaching process. Chlorine is saved.

Another series of experiments was carried out with the alkali treatment taking place after the preliminary bleaching. The color of the pulp was compared with that bleached by different methods. The accompanying illustration shows the type of apparatus employed in making the test, two quartz lamps being used. The original article contains a number of illustrations and shows the various bleaching effects attained by the various bleaching processes used. Dr. L. Rys, Der Papier Fabrikant, 1928, pages 256 ff.

Paper Making Machine

THE wire in the papermaking machine, which is shown in the accompanying illustration, runs over pivotally connected shaking frames. The usual means for guiding and supporting the wire are provided. Means are also provided



for imparting to these frames different shaking motions. The wire is connected in positive manner to one of the frames carrying it. P. Erkens, Duren, Germany. United States Patent No. 1,670,884.

Sulphite Cooking

THE more important factors controlling the sulphite cooking process are discussed and it is suggested that the lime present in the cooking liquor acts not only as a neutralizing agent for acids formed during digestion, but also later, when sulphonation is complete, as an alkaline hydrolyzing agent, the normal calcium sulphite dissociating at about 128 degrees F. into free lime and sulphur dioxide. That calcium hydroxide is precipitated as such at a temperature of approximately 128 degrees F. (though it recombines to form calcium sulphite on cooling, and is found in this form on the fiber) is shown by an analysis of the precipitate obtained by heating sulphite liquor (free sulphur dioxide 3.84 per cent, combined sulphur dioxide 1.31 per cent) to 137 degrees F. and under 80 pounds per square inch. While the temperature is still above that at which the lime and sulphur dioxide recombine to form calcium sulphite, as much as possible of the supernatant liquor is drawn off. W. H. Birchard, Canadian Chemistry and Metallurgy, 1928, vol. 12, pp. 31 to 34.

Paper's Ancestor

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ERIE, PA.

New York, July 2, 1928.

IT IS NOTHING unusual at just about this time of the year to witness a slowing down of demand for paper of most kinds. With the summer on tap, and with it the customary quieting of many of the consuming markets of paper, and with members of the paper and other trades commencing to give attention to vacations, there is a certain amount of reserve in the conduct of business in paper as well as in other commodities, and the market obviously is suffering to the usual seasonal degree. It cannot be said that demand for paper is dull, neither is it brisk. Consumers, and more especially those transient buyers who depend in large measure for their supplies on day to day or week to week purchases, are letting down in their buying operations, while large users of paper who contract for supplies also are manifesting less disposition to buy while apparently managing to get along with commitments on contracts without having to resort to additional purchases. and converters too are ordering in smaller volume. Thus, the market is being affected by seasonal conditions, and trade activity is on the wane.

Moreover, the slackening of demand for paper is reflected to some extent in the present price situation. There is without doubt an easy undertone in quotations on some classes of paper. Competition between manufacturers and the eager desire to secure sufficient orders to keep mills going at a pace within respectable distance of capacity is causing some shading of prices. It is no secret that buyers are succeeding in filling their wants at concessions in certain cases, and in one or two instances there is a decided downward trend in market rates of particular classes of paper. This, it might be stated, also is a part of the seasonal condition.

Total production of all grades of paper in the United States in April was 581,000 tons, as compared with 607,017 tons in the preceding month and 557,850 tons in February, according to reports to the American Paper and Pulp Association from members and co-operating organizations. The total production during the first four months of this year was 2,306,511 tons, against 2,275,969 tons in the corresponding time last year. Although the total April output was about 4 per cent lower than that in March, the daily average production for April was 3 per cent greater than in the preceding month, the lower total being the result of two less working days in April. The daily average production in April, 1928. was about 5 per cent larger than in April a year ago. Mill stocks of paper of all kinds at the end of April amounted to 272,321 tons, as contrasted with 260,917 tons a month earlier. Shipments of paper from mills during April aggregated 568,311 tons, which means that manufacturers produced somewhat more paper than they shipped out in that month, and compared with 606,428 tons shipped in March.

Production of newsprint paper in May recorded an appreciable increase as compared with the preceding month, totaling 329,821 tons for both the United States and Canada, against 310,198 tons in April, while shipments from mills in May were 326,376 tons for both countries, compared with 311,896 tons in the preceding month, according to the monthly statistical report of the News Print Service Bureau. Production in Canada amounted to 203,811 tons in May and shipments from mills to 203,836 tons, while production in the United States was 126,010 tons and shipments 122,540 tons. During May 20,497 tons of newsprint were made in Newfoundland and 1,257 tons in Mexico, so that the total North American output for the month amounted to 351.575 tons, contrasted with 32,995 tons in April.

The Canadian mills produced 146,099 tons more of newsprint in the first five months of 1928 than in the same period of 1927, which was an increase of 18 per cent. The United States mills' output was 48,640 tons, or 8 per cent, less than for the first five months of last year; production in Newfoundland was 10,784 tons, or 13 per cent more, and in Mexico 49 tons less, making a total North American increase of 108,194 tons, or 7 per cent, over the first five months of 1927. During May the Canadian mills operated at 80.8 per cent of rated capacity, and the United States mills at 83.7 per cent. Stocks of newsprint at Canadian mills at the end of May totaled 46,290 tons, and at United States mills 37,207 tons, making a combined total of 83,497 tons, which was equivalent to 5.6 days' average production.

Production of paper board in the United States mounted sharply in May as compared with April, totaling 241,919 tons, against 221,046 tons in April, according to the statistical summary of the board industry compiled by the U. S. Department of Commerce. Board production in this country in the first five months of the current year reached a total of 1,108,559 tons, against 988,531 tons in the same period last year. Manufacturers received new orders calling for 224,220 tons of board during May, contrasted with 211,237 tons in the preceding month, and had unfilled orders at the end of May for a total of 73,157 tons, against 84,513 tons a month earlier. Shipments of board from mills in May aggregated 235,648 tons, compared with 220,248 tons in April, and stocks of board at mills at the end of May were 48,906 tons, against 40,312 tons a month previously.

Further reports of price readjustments in newsprint on a downward scale have been received. It is stated on good authority that some manufacturers, more particularly those in Canada, have revised the contract basis on a level representing a cut of from $2 to $5 per ton in newsprint, whereby publishers are securing paper down to $60-$63 per ton f.o.b. mills. Other producers are exerting every effort to maintain their prices, but obviously the sagging of quotations in certain quarters is making for instability in the market and is encouraging consumers to demand lower rates. It can be said that something approaching a price war seems to be developing in the newsprint industry. Certain of the big mills in Canada have withdrawn from the selling organization, and are marketing their product as individuals, reducing quotations and leading to a generally upset market situation. How far this condition may go, it is difficult to state, but the conservative element in the industry is reported striving to stabilize the market once more.

There has been a fairly sharp reduction in prices of southern kraft paper also. Announcement was made several weeks ago of a cut of half a cent per pound, bringing quotations down to 4 cents per pound for sheets and 3.75 cents for rolls f.o.b. mills in the South. This recession in prices came as a surpjrise in the trade, since it followed so closely upon a similar reduction, thereby making a total cut of a full cent per pound since April last.

Book paper is moving fairly well as regards tonnage, and in a steady manner. In fact, it is said on some parts of the trade that book paper manufacturers as a class probably are busier than any other group of papermakers at present. Prices are being maintained moderately well although now and then an instance comes to light where some mills have granted concessions. Fine papers are in a steady quotable position, but demand has slackened to some extent. Tissues are in relatively slow demand, and prices rule easy of tone. Building felts and papers are moving in good volume, and so is wall board. Box boards of most kinds have passed through a somewhat dull spell but are beginning to exhibit increased market activity, and reports say that prices are steadying, following a period of easiness.

SOLVAY PRODUCTS

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Papermaking Rags

Activity in the papermaking rag market is of restricted dimensions. There is moderate life in the trade in some of its branches, but the aggregate amount of business current is reported comparatively light, which can be said reflects the cautious buying operations of paper manufacturers. Evidently, papermakers realize that there are plenty of rags available, of practically all grades, and that in all probability slightly higher market prices would bring out additional supplies, and few or no purchasing agents of paper mills are placing orders for other than rags actually and directly required.

As stated, there are fairly active spots in the market. Roofing rags recently experienced a brisk period, though demand now has quieted; some of the grades of new rags are moving steadily, and consumers are absorbing certain of the better grades of old cottons. However, demand is not sufficient to cause any alteration in prices, and market levels are merely holding their own with changes that occur mostly in favor of buyers. Dealers assert that the statistical position of the market is quite strong. They point out that spring collections this year, as indicated by the quantities of rags coming into the market of late, did not measure up to normal, and that importations of nearly all classes of papermaking rags have declined substantially. Moreover, it is contended that demand recently has been ample to absorb the floating supply of rags in the market, and that consequently there is no material accumulation of any grade in the hands of packers and dealers.

Roofing rags stiffened in price a short while ago when sales of No. 1 domestic roofing or cloth strippings were reported at 1.90 cents a pound f.o.b. New York, of No. 2 domestic packing at 1.55 cents, and of foreign dark colored cottons at 1.65 cents ex dock New York. Prices at present remain on about these levels, though since demand subsided it is possible that mills are buying in some cases at slightly less. From all indications, the market is well sold up on roofing rags, and dealers and importers are insisting on the figures they quote, while importers declare it is very difficult for them to buy abroad at the rates paper mills here are willing to grant and realize a profit, reflecting the fact that rag markets in Europe are relatively higher than here.

Old white cottons are in routine demand chiefly and quotations show little or no change. Dealers ask 5.50 cents or higher, depending on the quality of packing, for No. 1 repacked whites f.o.b. shipping points, and 2.50 to 3 cents for No. 2 repacked whites. Repacked thirds and blues are bringing about 2.25 cents a pound at dealers' points, and rough blues around 1.80 cents per pound. Fair demand exists for cotton batting, though market prices of this grade have eased off a bit, while old black cotton stockings are reported moving freely, both to paper mills and for export to Europe.

In new cuttings, most of the market activity recorded lately has involved a few certain grades. Unbleached cuttings have moved well and at a firm price basis of 10 to 10.25 cents a pound f.o.b. New York, while bleached canton flannels have sold freely at 9.25 to 9.50 cents, as have light silesias at 7.25 to 7.50 cents, and fancy shirt cuttings at 5.25 cents to slightly higher. A fair demand is reported for blue overall cuttings at 6.75 to 7 cents at dealers' shipping points, and for O.D. khaki cuttings at 5.50 cents. White shirt cuttings are more or less neglected by paper mills, and it is stated that purchases of No. 1 quality are possible down to 11 cents although most dealers quote a quarter to a half cent per pound higher, while No. 2 white shirt cuttings are quoted at 7.25 cents upward, according to packing.

Other than in roofing grades, foreign rags are in slow call and prices are on the easy side despite the firm rates shippers abroad insist upon. Business in such rags is, to say the best, of slight dimensions and very spotty in character.

Average quotation f.o.b. shipping points and ex dock New York are as follows:

New Stock	New York and Chicago
White shirt cuttings, No. 1	11.00-11.50
White shirt cuttings, No. 2	7.00- 8.00
Fancy shirt cuttings	5.25- 5.50
Washables, No. 1	4.25- 4.50
Unbleached muslin	10.00-10.25
White lawns	9.25- 9.50
Overall cuttings, blue	6.75- 7.00
Black silesias	4.50- 4.75
Light flannelettes	8.00- 8.25
Canton flannels, bleached	9.25- 9.50
Canton flannels, unbleached	8.50- 8.75
Shoe cuttings, bleached	8.25- 8.50
Shoe cuttings, unbleached	6.50- 6.75
Light silesias	7.25- 7.50
O. D. khaki cuttings	5.50- 5.75
Mixed khaki cuttings	5.00- 5.25
Corduroy cuttings	3.25- 3.50
Cottonade cuttings	3.25- 3.50
Linens, No. 1, white foreign	13.00-14.00
Light prints, foreign	2.75- 3.00
Old Stock—	
Whites, No. 1, repacked	5.50- 6.50
Whites, No. 2, repacked	2.50- 3.00
Whites, house soiled	2.00- 2.25
Whites, street soiled	1.85- 2.00
Lace curtains	5.75- 6.00
Thirds and blues, rough	1.75- 1.90
Thirds and blues, repacked	2.15- 2.35
Black stockings	4.10- 4.25
Cotton canvas, No. 1	4.75- 5.00
White cotton batting	4.50- 5.00
Roofing, No. 1 (cloth strippings)	1.85- 2.00
Roofing, No. 2	1.50- 1.60
Linsey, garments, foreign	1.80- 1.85
Dark colored cottons, foreign	1.60- 1.65
Blue linens, foreign	3.75- 4.00
Gray linens, foreign	4.00- 4.25
White linens, foreign	7.50- 8.00
Light prints, extra foreign	1.80- 2.00

Rope and Bagging

The demand for old rope is quite pronounced, and the market tone is firm. There is, in fact, a decided upward tenddency in prices, and dealers declare that they are not receiving anything like normal amounts of old rope from domestic producing quarters and that consequently they are experiencing difficulty filling the wants of paper mills. Imports of old rope have shown some increase recently, which indicates consumers are looking abroad to secure a good part of their requirements. Domestic No. 1 old manila rope is quoted at 3.50 to 3.75 cents a pound f. o. b. dealers' points, and foreign No. 1 manila rope at 3.25 to 3.50 cents ex dock New York, and it is reported that sellers are unwilling to book orders under these figures. Strings, on the other hand, are in slow demand, and the price tone is soft. Mixed strings are quoted at 90 cents per hundred pounds upward f. o. b. dealers' points, and sisal strings at 1.50 to 1.75 cents.

Bagging for roofing mills is reported in fair demand, and generally dealers ask 1.30 cents a pound f. o. b. and ex dock

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Georgia-Louisiana Company, East Point, Ga., Marrero, La.
Superior Pine Products Company, Fargo, Ga., Tarver, Ga.
Empire Size & Chemical Co., Albany, N. Y.
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Superior Sizing Company, Lockport, N. Y.
Paper Makers Importing Co., Easton, Pa., St. Austell, Cornwall, Eng.
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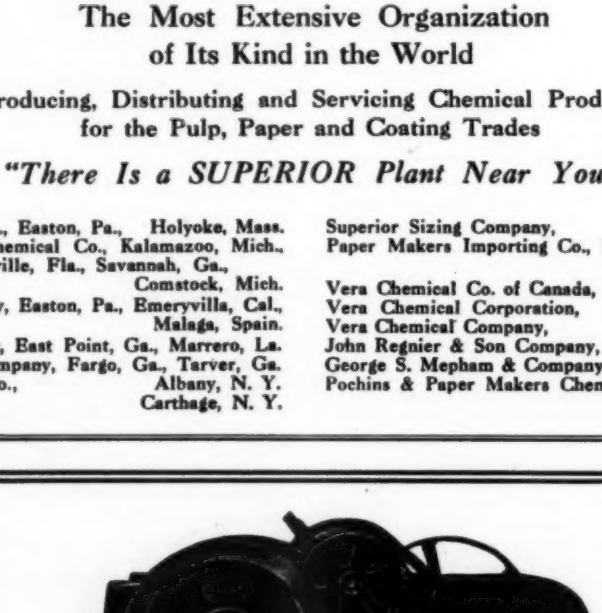

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New York for this grade of scrap bagging. No. 1 bagging is largely neglected by paper mills and it is said that the little buying being done is at a price level of around 1.65 cents per pound at shipping points.

F.o.b. shipping point and ex dock New York quotations follow:

	New York and Chicago
Gunny, No. 1 domestic	1.65-1.80
Gunny, No. 1 foreign	1.60-1.70
Scrap bagging, No. 1	1.60-1.70
Roofing bagging	1.25-1.35
Wool tares, heavy	2.25-2.50
Wool tares, light	2.00-2.25
Manila rope, No. 1 foreign	3.25-3.50
Manila rope, No. 1 domestic	3.50-3.75
Sisal strings	1.50-1.75
Mixed strings	.90-1.10

Old Paper

There appears to be a fairly steady movement of old paper of most grades, and market prices are holding their own with certain classes of stock exhibiting a strengthening tendency. On the other hand, several grades have eased off slightly in value, due to mill demand having subsided to at least a sufficient degree to lead to some accumulation of supply in the market. This is especially true as regards book stock, prices of which are down from the levels prevailing recently and demand for which unmistakably is quieter than it was. Shippers in some instances are reported accepting orders for No. 1 heavy books and magazines at 1.80 cents f. o. b. shipping points, and it is possible that mills have succeeded in buying in exceptional cases at a shade under this price basis. Ledger stock is moving freely on a price range of 1.70 to 2 cents per pound at dealers' points, depending on the quality of packing, and a bit more demand is reported for soft white shavings, with quotations extending from 2.20 to 2.50 cents a pounds, according to packing.

Old No. 1 mixed paper is selling readily to board mills and is bringing 45 cents per hundred pounds and slightly higher f. o. b. New York, while in the Middle West well above this price is being paid. Similarly, folded news is quoted on a fairly broad range of about 55 cents per hundred pounds in the East to up around 65 to 70 cents in the West. Old No. 1 kraft paper is selling at 1.75 to 1.90 cents a pound f. o. b. shipping points, No. 1 manilas at around 80 cents per hundred pounds, and white blank news at 1.45 cents a pound. Hard white shavings are in slow demand and quoted prices are irregular and on a wide scale of from 2.70 to 3 cents a pound, depending on the source and quality of stock concerned.

The following are quotations named by dealers f. o. b. shipping points:

	New York and Chicago
Hard white shavings, No. 1	2.70-3.00
Hard white shavings, No. 2	2.50-2.75
Soft white shavings	2.20-2.50
Colored shavings	1.00-1.25
Heavy book, No. 1	1.75-1.90
Crumpled book, No. 1	1.45-1.55
Ledger stock	1.70-2.00
Kraft, No. 1	1.75-1.90
New kraft cuttings	2.50-2.75
Manilas, No. 1	.75- .85
White blank news	1.40-1.50
Overissue news, No. 1	.65- .75
Folded news	.55- .70
Sulphite mill wrappings	.70- .80
Old corrugated boxes	.65- .70
New corrugated box cuttings	.80- .90
Mixed paper, No. 1	.45- .60
Common paper	.35- .40

Pulpwood

The pulpwood market is quiet, other than for the routine movement of supplies against contracts. There is little open-market demand, grinders apparently operating their plants

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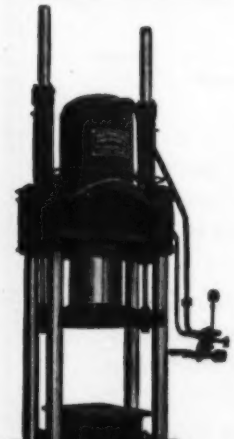
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on curtailed schedule and therefore being amply supplied with wood through receipts on contracts. Prices are rather irregular, it is said, depending on location, type of wood, etc.

Exports of pulpwood from Canada in May, 1928, amounted to 71,008 cords, valued at $711,165, all of which came to the United States, compared with 70,510 cords of a value of $624,975 exported in the preceding month, and 94,736 tons of a value of $966,778 in May, 1927.

Mechanical Pulp

A very quiet market exists for mechanical wood pulp, and prices display an easy undertone. Demand from consuming quarters has slowed down to a degree where grinders in a good many cases have closed their plants temporarily to await call for their product, but in spite of the curtailed production it would appear as if there is ample supply available in the market. The reason for the present market condition is none other than that manufacturers have been afforded plenty of water in mill streams this spring and therefore have been enabled to grind all the pulp they need without having to resort to open-market purchases. Grinders who produce ground wood for sale to transient buyers, being unwilling to market their product at losing prices, simply have stopped grinding until an improved market condition develops, which, of course, should be witnessed later in the summer.

Canadian ground wood is quoted on a range of $21 to $25 per ton f. o. b. pulp mills in the Dominion, while domestic ground wood nominally is around $26 a ton at producing plants. Imported ground wood of Scandinavian origin is quoted at $31 per short ton ex dock New York or other American Atlantic ports for dry pulp.

Production of ground wood in the United States in April last amounted to 97,426 net tons, compared with 93,391 tons in the preceding month, according to the American Paper and Pulp Association. Mill stocks at the end of April totaled 113,063 tons, against 100,873 tons a month previously. These figures more or less substantiate the market statistical position outlined above.

Chemical Pulp

There is little change occurring in the market for domestic chemical wood pulp. Demand is holding up fairly well, most producers are moderately busy and are shipping out their product regularly against contracts and back orders, and prices are steady to firm. From all indications, manufactures are securing enough business to prompt them to name consistent prices, and there is not a great deal of selling pressure in evidence. On the other hand, consumers appear desirous only of satisfying definite requirements.

Leading manufacturers of domestic bleached sulphite are quoting 3.75 to 4 cents a pound f. o. b. pulp mills for the most popular grades of this class of pulp, with extra qualities priced up to 4.75 cents. No. 1 strong unbleached sulphite of news grade is quoted at 2.50 to 2.75 cents at producing plants, and No. 1 book sulphite at 2.75 to 3 cents. Bleached soda pulp is bringing 3 to 3.25 cents a pound f. o. b. pulp mills, and No. 1 domestic kraft 2.75 to 3 cents per pound.

During April last, production of chemical pulp in the United States reached a total of 119,271 net tons of all grades, showing a decline from the 129,302 tons produced in March, according to statistics compiled by the American Paper and Pulp Association. Mill stocks at the end of April agregated 25,587 tons, contrasted with 26,464 tons a month earlier.

Quotations f. o. b. pulp mills are as follows:

Bleached sulphite	3.75-4.75
Easy bleaching sulphite	2.75-3.00
Unbleached sulphite, No. 1 strong (news grade)	2.50-2.75
Unbleached sulphite, No. 1 book	2.75-3.00
Soda pulp, bleached	3.00-3.25
Mitscherlich, unbleached	3.00-3.25
Kraft, No. 1	2.75-3.00
Screenings, refined	1.40-1.60

Chemicals

Following a quieter period, demand for casein is reported to have quickened again, and prices display fair firmness at

Things that paper tests show

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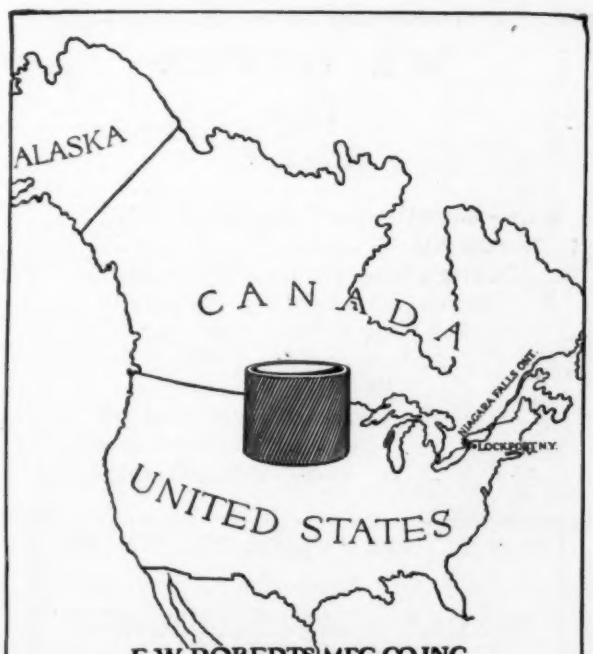

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White sulphite	9.30
Colored rag	15-40
Colored sulphite	8-30
Ledger—	
White rag	16-40
White sulphite	9-30
Colored sulphite	8-30
Colored rag	15-40
Bonds—	
White rag	16-40
White sulphite	7-30
Colored sulphite	7-30
Colored rag	15-40
Books—	
No. 1 S. & S. C.	5.75- 8.00
Machine finished	5.50- 8.00
English finished	5.50- 8.00
Coated and enameled	8.00-14.00
Lithograph, M. F.	8.00-15.00
Newsprint—	
Rolls, contract	3.00- 3.25
Rolls, transient	3.25- 3.50
Sheets	3.50- 3.75
Side runs	2.90- 3.15
Cover stock—	
Coated, both sides	10.25
Coated, one side	10.15
Tissue—	
No. 1 white, 20x30	.75- .90
No. 2 white, 24x36	.75- .80
No. 1 manila, 24x36	.70- .80
Kraft	.90- 1.00
Wrapping—	
No. 1 kraft	5.50- 6.00
No. 2 kraft	4.50- 5.00
Southern kraft	3.75- 4.00
Boards—	New York and Chicago
Solid news	45.00-50.00
Straw	52.50-57.50
Plain chip	40.00-42.50
White coated chip	50.00-55.00
Manila coated chip	50.00-55.00
Binder's board	70.00-75.00

Chemicals

(*Continued from page 735*)

between 15.50 and 16.50 cents per pound for the domestic product, and 16 to 16.50 cents for imported casein. Soda ash quotations are steady at 1.32½ cents a pound for the 50 per cent light product in bags at works, and caustic soda is quoted unchanged at 2.90 to 3 cents per pound f. o. b. works. Bleaching powder is moving freely though principally on contracts at a price basis of 2 to 2.35 cents a pound at works.

Average quotations are as follows:

Alum, lump ammonia	3.50 - 3.75
Alum, lump starch	3.75 - 4.00
Blanc fixe, powder	3.50 - 3.75
Bleaching powder	2.00 - 2.35
Brimstone (long ton, at mine)	18.00 -20.00
Casein (duty paid)	15.50 -16.50
Caustic soda, spot delivery	2.90 - 3.00
China clay, domestic washed	8.00 -10.00
China clay, foreign	14.00 -20.00
Rosin, Grade E	9.35 - 9.50
Satin white	2.00 - 2.25
Soda ash, 50 per cent light (bags)	1.32½- ....
Starch, papermakers', in bags	4.12 - ....
Talc (ton)	16.00 -18.00

Market Quotations

Issued by H. D. Knox & Co., 44 Broad St., New York

The quotations mentioned below are more or less nominal in some cases owing to the inactivity of the securities, but we invite inquiries on these and other allied industries' securities when we will endeavor to furnish actual markets.

BONDS	Bid	Asked
Abitibi Fibre Company 6s, 1947	104	
Abitibi Power & Paper Co. 5s, 1933	93	95
Abitibi Power & Paper Co. 6s, 1940	105	106
American Sales Book Co. 6s, 1939	102½	
Advance Bag & Paper 6s, 1952	99	
Bastrop Pulp & Paper Co. 6½s, 1940	104½	
Beaver Products 7½s	109	111
Beaver Board Co. 8s, 1933	102	103
Bedford Pulp & Paper 6½s, 1942	98	100
Belgo Canadian Paper 6s, 1943	103	105
British Columbia Pulp & Paper 6s, 1950	91	93
Brompton Pulp & Paper 6s, 1935	103	
Brompton Pulp & Paper 6s, 1946	104	
Brown Company 5½s, 1946	102	
Brush Moore Paper Co. 6½s, 1937	97	98½
Bryant Paper Co. 6s, 1942	166	101
Celotex Co. 6s, 1936	OW	100
Celotex Co. 6½s, 1939	99	101
Canada Paper Board Co. 7s, 1937	96½	98½
Central Paper Co. 6½s, 1941	86	89
Central Paper Co. 6s, 1933	86	89
Central Paper Co. 7s, 1932	87	92
Champion Fibre Co. 6s, 1941	101½	103
Champion Paper Co. 6s, 1945	95	98
Champion Coated Paper Company 6s	102½	
Columbia River Paper Mills, 6s	98	
Defiance Paper Co. 6s, 1939	98	100
Dells Paper & Pulp Co. 6s, 1939	95	98
Donnacona Paper Co. 5½s, 1948	95	97
Eastern Manufacturing 7s, 1938	98	100
Escanaba Paper Co. 6s, 1939	98	100
Escanaba Paper Co. 5s, 1928	99	101
Filer Fibre 7s, 1937	93	
Fort William Paper Co. 6s, 1946	101	102
Fitchburg Paper Co. 5s, 1929	99	
Glatfelter Paper Co. 6s, 1938	104	106
Hammermill Paper 6s, 1939	101½	
Hartje Paper Co. 6s	1	
Hawley Pulp & Paper Co. 6s, 1946	100	
Hoberg Paper & Fibre 7s, 1937	94	96
Industrial Fibre Co. 8s	100	102
Itasca Paper Co. 6s	99	
Itasca Paper & Prarie River 5½s	100¼	
Jessup & Moore Paper Co. 6s, 1945	90	92
Kalamazoo Vegetable Parchment 6s, 1938	99	101
Manitoba Paper Co. 6½s	103	105
Mead Fibre Co. 7s, 1937	100	
Munising Paper Co. 6s, 1936	98	
Marathon Paper Mills 5½s, 1942	99	
Marinette & Menominee Paper Co. 7½s, 1936	103	104
Mead Pulp & Paper Co. 5s	95½	
Mengel Co. 7s, 1934	103	105
Mengel Co. 7s, 1933	101	
Minnesota & Ontario Paper Co. 6s	98	100
Missisquoi Pulp & Paper Co. 7s, 1929	99½	
Missisquoi Pulp & Paper Co. 6s, 1945	99	
Monroe Paper Products 7½s, 1932	97	99
Murray Bay Paper Co. 6½s	103	
Oswego Falls Paper Company 6s, 1941	100	103
Parker Young Co. 6½s, 1944	98	100
Paper & Textile Machinery Co. 7s	100	103
Paterson Parchment Paper 6s 1938	101	103
Peerless Paper Co. 6s	98	100
Penobscot Chemical Fibre 6s, 1942	102	105
Price Bros. 6s, 1943	106	108
Queen City Paper Company 7s	97	99
Riordan Pulp & Paper Co. 6s, 1942	102	
River Raisin Paper Co. 6s, 1936	98	101
Rolland Paper Co. 6s, 1937	99	101

(*Continued on page 745*)

The B C-INC. QUALITY PULPS

"HAFSLUND BEAR"
Bleached Sulphite

"FORSHAGA"
Bleached Sulphite

"HURUM SPECIAL"
Extra Strong Kraft

NORWAY SPECIAL

"BAMBLE"
Extra Strong Kraft

KOOS BAC

Fresh Monthly Shipments—No Closed Winter Season

The Borregaard Company
Incorporated
200 FIFTH AVENUE NEW YORK, N. Y.

The Pulp and Paper Trading Co.
21 East 40th Street New York City

Dealers in
Domestic Chemical and Mechanical Pulps and Paper

AGENTS FOR
J. & J. ROGERS COMPANY, Ausable Forks, N. Y.
E. B. EDDY COMPANY, LTD., Hull, Canada
CANADIAN KRAFT LIMITED, Three Rivers, Canada
Dealers in Wayagamack Kraft Pulp
Howard Smith Paper Mills, Montreal, Quebec.
EASTERN AGENTS of Sulphite Pulp
Made by Port Huron Sulphite & Paper Co., Port Huron, Mich.

J. ANDERSEN & CO.
21 East 40th Street New York City

Importers of Chemical Pulps
BLEACHED AND UNBLEACHED

Agents for Kellner Partington Paper Pulp Co., Ltd.
Sarpsborg, Norway; Forshaga, and Edsvalla, Sweden

PULP

PERKINS-GOODWIN CO.
Established 1846
551 FIFTH AVENUE, NEW YORK

PAPER

EXPORTS

Exportations of paper from the United States in April, 1928, dropped off slightly in point of value as compared with the preceding month but showed a gain over the shipments in the corresponding month of last year, according to official statistics compiled and issued by the U. S. Department of Commerce in Washington. During April last exports of paper of all kinds from this country totaled in value $2,395,854, contrasted with exports valued at $2,740,820 in March this year, and $2,351,118 in April, 1927. Exports of paper during the first four months of the current year, aggregating $9,947,910 in value, recorded a fair rate of gain over the exports of a value of $9,169,757 in the same period a year ago.

Exports of newsprint in April last amounted to 1,276,994 pounds, valued at $46,076, against 1,707,788 pounds of a value of $63,014 in the preceding month, and 2,145,001 pounds of a value of $100,853 in April last year. Shipments of book paper, not coated, increased from 1,118,746 pounds of a value of $104,367 in April, 1927, to 1,453,468 pounds of a value of $127,682 in April of this year, whereas wrapping paper exports declined somewhat, totaling 2,531,956 pounds of a value of $175,630 last April, against 2,714,238 pounds of a value of $206,133 in the same month last year. There was a sharp gain in writing paper exports to a total of 1,912,253 pounds of a value of $259,064 in April last, contrasted with 922,833 pounds of a value of $136,676 in the similar month of 1927. Box board exports from the U. S. also increased sharply to 6,577,124 pounds of a value of 176,901 in April this year, compared with 3,863,219 pounds of a value of $122,323 a year ago.

Exports of paper boxes and cartons from the United States in April last were valued at $128,965, against $135,473 in the same month last year.

IMPORTS

Wood Pulp

While reports with few exceptions state that paper manufacturers are proceeding rather carefully in purchasing, and that the market for wood pulp therefore rules comparatively quiet, there is one market characteristic which stands out very prominently and that is firmness of prices of imported pulps. There is every reason to believe, and advices from abroad substantiate, that mills in Scandinavia as well as other parts of Europe are well sold up on most classes of pulp, and, as more or less proof that this is so, offerings from producers on the other side of the Atlantic are decidedly smaller and fewer than is the case ordinarily, while selling pressure on the part of importers and agents in New York is almost an unknown quantity at present. There is, of course, business going through right along, and consumers in the United States are in some instances manifesting pointed interest in the supplies of pulp available, so that although the market in its entirety may be a bit quiet at the moment, nevertheless a considerable amount of business is transpiring.

Nearly everyone on the selling side of the trade is of the firm opinion that no lower market prices than now prevail will be witnessed on foreign pulps during the remainder of this year. It is pointed out that producers in Sweden and Norway have limited tonnage to dispose of over the next five months or until the closed navigation season is due to set in next winter, and it is felt also that paper manufacturers in the United States, in England and elsewhere still have a good portion of their potential requirements to cover, which is expected to lead to the development of fairly good demand in the next few months. Arrivals of pulp at New York and other American Atlantic ports since first open water shipments from Sweden began this spring have been fair, but it is contended by New York importers that less than the usual tonnage has come in, and that, as a matter of fact, many shippers in Scandinavia have fallen behind in their shipments and have failed to send the customary quota of tonnage thus far this season. Therefore, increased imports have not disturbed the market in the least; receipts have been absorbed readily, and some papermakers have been a bit apprehensive over not having received as large supplies as they have expected.

Imports of wood pulp into the United States in April showed a slight falling off as compared with the preceding month, according to official figures issued by the U. S. Department of Commerce. Chemical pulp to the total amount of 72,171 long tons, valued at $4,239,189, was imported in April, against 74,536 tons of a value of $4,487,328 in the preceding month, while imports of mechanical pulp amounted to 16,562 long tons of a value of $421,971 in April, contrasted with 18,861 tons of a value of $455,967 in March last. Chemical pulp imports during the first four months of this year aggregated 403,733 tons, giving a monthly average of 100,933 tons, against a monthly average of 94,292 tons in the corresponding period a year ago, while total imports of ground wood in the same time amounted to 73,244 tons for a monthly average of 18,311 tons, against 16,362 tons monthly average in the similar period of 1927.

Bleached sulphite of prime quality is quoted from 3.75 cents per pound upward ex dock New York or other American Atlantic ports, while strong prime unbleached sulphite is firm at 2.70 to 2.75 cents on the dock, prime easy bleaching at around 2.90 cents, and ordinary Mitscherlich unbleached at 2.65 cents. Prime standard Swedish craft is quoted at 2.70 cents ex dock, and prime dry ground wood at $31 per short ton.

Current market quotations ex dock New York, and receipts at the port of New York during June, follow:

Bleached sulphite, No. 1	3.75	4.00
Unbleached sulphite, strong No. 1	2.70	2.85
Unbleached sulphite, No. 2	2.50	2.60
Easy bleaching sulphite	2.85	3.00
Mitscherlich unbleached, genuine	3.00	3.25
Mitscherlich unbleached, ordinary	2.60	2.75
Kraft, standard Swedish	2.70	2.80
Ground wood, per ton (dry)	31.00	32.00

E. M. Sergeant Co., 1,372 bls. from Gothenburg and 160 Oslo; Price & Pierce, 200 bls. from Gothenburg; Castle & Overton, 7,801 bls. from Hamburg, 399 Rotterdam and 150 Sunsvall; Atterbury Bros., 2,000 bls. from Oslo and 953 Bremen; Chemical National Bank, 1,826 bls. from Oslo; E. J. Keller Co., 1,339 bls. from Hamburg; Pagel, Horton & Co., 5,000 bls. from Gefle and 300 Gothenburg; Bulkley, Dunton & Co., 1,250 bls. from Gefle, 625 Sunsvall, 125 Bremen, 1,500 Hernosand and 8,021 Soderham; Johaneson, Wales & Sparre, 2,050 bls. from Sundsvall and 570 Gothenburg; M. Gottesman & Co., 1,975 bls. from Sundsvall and 300 Stockholm; Scandinavian Pulp Agency, 1,100 bls. from Sundsvall and 3,605 Skutskar; Buck, Kiaer & Co., 300 bls. from Stockholm; American Exchange Irving Trust Co., 160 bls. from Oslo and 700 Gothenburg; Chase National Bank, 800 bls. from Oslo; Equitable Trust Co., 250 bls. from Gothenburg; J. Andersen & Co., 6,600 bls. from Hernosand and 2,000 Soderham; Order, 1,033 bls. from Hamburg, 125 Copenhagen, 3,975 Greaker, 155 Bremen, 1,365 Wiborg, 872 Kotka and 905 Tolkis.

Paper Stock

Imports of papermaking rags into the United States in

RUSS GELATIN CO.

WORKS—WESTFIELD, MASS.

MANUFACTURERS OF

GELATIN and GLUE

ANIMAL SIZING GLUE STOCK

LARGEST SPECIALISTS IN AMERICA ON

FINE WRITING PAPER SIZING

E. F. RUSS COMPANY 227 Atlantic Avenue BOSTON, U. S. A.

NATRONA POROUS ALUM

Liquid Chlorine

Single Unit Tank Cars Multi-Unit Tank Cars
150-Lb. Cylinders (1-Ton Containers)

Commercial Sulphate of Aluminia

Standard Bleaching Powder

Pennsylvania Salt Mfg. Company

Philadelphia, Pa.

Bathurst Power & Paper Company, Limited

PRICE & PIERCE, LTD.

17 East 42nd Street, NEW YORK CITY

ARE NOW THE

SELLING AGENTS

for Bathurst Pulp in the United States

Unbleached Sulphite 50 tons daily
Kraft Pulp 50 tons daily

Our pulp is made from Canadian Spruce
We ship in Sheets, baled

BATHURST, NEW BRUNSWICK, CANADA

MITTS & MERRILL GRAVITY FEED SHREDDER

Reduces Paper Stock

Magazines, books, old paper and boxboard, frozen or dried pulp laps run through the Mitts & Merrill Gravity Feed Shredder are reduced to particles which hydrate readily when put into the beaters.

Built in six sizes with spouts ranging from 18" to 45" wide

Reduces Cost

Because shredding in the Mitts & Merrill Gravity Feed Shredder expedites hydration in the beaters there is considerable saving made in power. Thus we see that the shredder here illustrated reduces costs while it is reducing paper stock.

We will be glad to furnish details upon request.

We also build a 100% efficient "Hog" to reduce pulp mill bark and wood refuse

See pages 368 and 369 in the 1927 Paper and Pulp Mill Catalogue

MITTS & MERRILL 1013 Tilden St. SAGINAW, MICH.

the first four months of this year amounted to 134,078 pounds, valued at $2,513,028, showing a rise over the 128,974,944 pounds of a value of $2,761,918 imported in the same time of 1927, according to U. S. Department of Commerce statistics. Imports of waste bagging, waste paper, etc., in the similar period were 46,167,434 pounds, against 24,737,968 pounds last year, and imports of old rope and miscellaneous paper stock totaled 17,617,985 pounds, against 18,466,460 pounds a year ago.

Imports of rags were rather light in June, judging from receipts through the port of New York, whereas arrivals of old rope showed a gain and receipts of miscellaneous paper stock were comparatively heavy. Arrivals of papermaking material of all kinds excepting wood pulp at New York in June were as follows, these data being taken from manifests of steamers reaching that port during the month.

Old Bagging—Chase National Bank, 298 bls.; Goschens & Cunliffe, 436 bls.; Overton & Co., 210 bls.; Castle & Overton 125 bls.; E. Buterworth & Co., 78 bls.; Anglo-South American Trust Co., 54 bls.; Banca Commerciale Italiana Trust Co., 212 bls.; E. J. Keller Co., 438 bls.

Old Rope—Brown Bros. & Co., 736 coils and 78 bls.; E. J. Keller Co., 926 bls.; United Fibre Co., 289 bls. and 22 rolls; N. E. Berzen, 444 coils; W. Schall & Co., 149 bls.; Ellerman's Wilson Line, 156 bls.; International Purchasing Co., 898 coils and 5 bls.; American Exchange Irving Trust Co., 295 coils; E. Buterworth & Co., 249 coils; American Epress Co., 110 coils; Furness, Withy & Co., 190 bls.; Banca Commerciale Italiana Trust Co., 214 coils and 133 bls.; Alexander H. Searle, Inc., 73 coils; Order, 52 coils and 697 bls.

Rags—Castle & Overton, 100 bls.; J. Cohen & Sons Co., 85 bls.; Whaling Waste Products Co., 18 bls.; Jaffe Products Co., 27 bls.; J. Reiss Co., 26 bls.; Aleander H. Searle, Inc., 114 bls.; Darmstadt, Scott & Courtney, 23 bls.; W. Lowenthal & Co., 26 bls.; P. Garvan, Inc., 111 bls.; E. Mayer, 34 bls.; Chase National Bank, 425 bls.; Manufacturers Trust Co., 30 bls.; Guaranty Trust Co., 300 bls.; State Bank, 56 bls.; Bank of Foreign Trade, 150 bls.; Bank of New York & Trust Co., 545 bls.; Merchants Bank & Trust Co., 30 bls.; National City Bank, 58 bls.; Bank of Manhattan Co., 101 bls.; Equitable Trust Co., 36 bls.; Union National Bank & Trust Co., 280 bls.; Interstate Trust Co., 88 bls.; Standard Products Corp., 80 bls.; Goschens & Cunliffe, 182 bls.; C. B. Richard & Co., 216 bls.; American Express Co., 190 bls.; Amsinck, Sonne & Co., 95 bls.; A. W. Fenton, Inc., 46 bls.; White Star Line, 20 bls.; E. J. Keller Co., 951 bls.; Order, 57 bls.

Miscellaneous Paper Stock—George W. Millar & Co., 780 bls.; Kidder Peabody & Co., 56 bls.; Aleander H. Searle, Inc., 723 bls.; Whaling Waste Products Co., 114 bls.; Victor Galaup, Inc., 1,471 bls.; Katzenstein & Keene, 322 bls.; International Mercantile Marine Co., 122 bls.; A. W. Fenton, Inc., 114 bls.; National City Bank, 790 bls.; Castle & Overton, 599 bls.; E. F. Hickey Sons, 64 bls.; C. R. Spence & Co., 356 bls.; E. J. Keller Co., 607 bls.; Henry W. Peabody & Co., 109 bls.; E. Butterworth & Co., 696 bls.; Robert Blank, 72 bls.; Salomon Bros. & Co., 240 bls.; Darmstadt, Scott & Courtney, 11 bls.; S. Birkenstein & Sons, 251 bls.; Bank of Manhattan Co., 910 bls.; Brown Bros. & Co., 382 bls.; Goldman, Sachs & Co., 68 bls.; Chase National Bank, 387 bls.; Banca Commerciale Italiana Trust Co., 1,240 bls.; Union Bank & Trust Co. of Philadelphia, 172 bls.; Arrowhead Mills, 323 bls.; William Steck & Co., 135 bls.; Fidelity Trust Co., 597 bls.; Interstate Trust Co., 244 bls.; E. Mayer, 104 bls.; Chemical National Bank, 235 bls.; George M. Graves Co., 77 bls.; Milton Snedeker Corp., 64 bls.; American Echange Irving Trust Co., 165 bls.; Equitable Trust Co., 35 bls.; T. D. Downing & Co., 90 bls.; New York Trust Co., 123 bls.; W. Lowenthal & Co., 30 bls.; Paul Berlowitz, 118 bls.; Bank of New York & Trust Co., 113 bls.; Philadelphia National Bank, 159 bls.; Order, 1,276 bls.

Paper

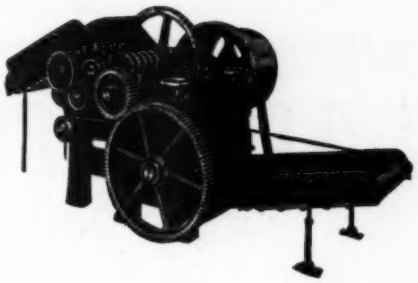
Imports of paper into the United States in April showed a slight decline in point of value as compared with the preceding month, but were larger than in the corresponding month last year. Total imports of paper of all kinds last April were valued at $12,118,411, contrasted with importations valued at $12,703,930 in March this year, and $11,317,487 in April, 1927, according to official Department of Commerce statistics.

Paper imports in June were fairly heavy, judging from arrivals at the port of New York. Imports of all kinds of paper at that port last month, these data being taken from manifests of steamers reaching New York during the month, follow:

Printing—A. S. Zabriskie, Inc., 100 reels from Bremen; Guaranty Trust Co., 283 bls. from Hamburg; Vernon Bros., 51 cs. from Glasgow; Walker Goulard Plehn Co., 3 bls. from Trieste, 21 bls. Sundsvall, 69 bls. Stockholm and 76 bls. Bremen; E. Dietzgen & Co., 321 cs. from Rotterdam and 23 cs. Hamburg; Steiner Paper Corp., 53 cs. from Rotterdam and 5 cs. Antwerp; S. Bienfang, 50 cs. from Rotterdam and 11 cs. Antwerp; P. C. Zuhlke, 215 cs. from Antwerp; B. F. Drakenfeld & Co., 124 cs. from Liverpool; New Haven Times Co., 108 reels from Gothenburg; Hudson Trading Co., 178 rolls from Sundsvall; Gilman Paper Co., 744 rolls from Stockholm; H. Reeve Angel & Co., 50 rolls from Stockholm, 347 reels and 123 cs. Kotka; Perkins-Goodwin Co., 588 reels from Hamburg; Keuffel & Esser Co., 108 reels from Hamburg; Hoboken Trust Co., 8 cs. from Bremen; P. Puttmann, 48 cs. from Antwerp;

PERKINS HOLYOKE

RAG and STOCK CUTTER

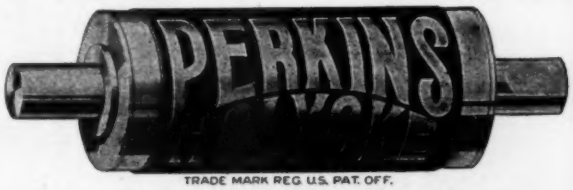


Perkins Rag and Stock Cutter is dustless in operation, makes no waste of stock and gives you clean shear-cut.

Perkins Cutter cuts the stock both ways and cuts it uniformly fine of the size desired. In cutting the stock this way, particularly rags, there is a decided saving in the time of beating these rags in the beater.

Perkins Cutter will give you an excess of 100 lbs. per minute with 7-½ h. p.

B. F. Perkins & Son, Inc., Holyoke, Mass.



TRADE MARK REG. U.S. PAT. OFF.

COTTON ROLLS - PAPER ROLLS - EMBOSSING ROLLS - CHILLED IRON ROLLS - GRANITE PRESS ROLLS - WEB SUPERCALENDERS - GLASSINE SUPERCALENDERS - FRICTION CALENDERS EMBOSSING CALENDERS - SHEET CALENDERS - PLATERS - MULLEN PAPER TESTERS TENSILE TESTERS - VENTILATING FANS - RAG CUTTERS - STOCK CUTTERS - PAPER DAMPENERS BLEACH EJECTORS

LOCKPORT TENAX FELTS

DIFFERENT AND BETTER

The Best Wools and Special Processed Yarns make them—DIFFERENT
Results, Finish, Durability and Entire Satisfaction make them—BETTER

TENAX FELTS for ALL grades of Paper

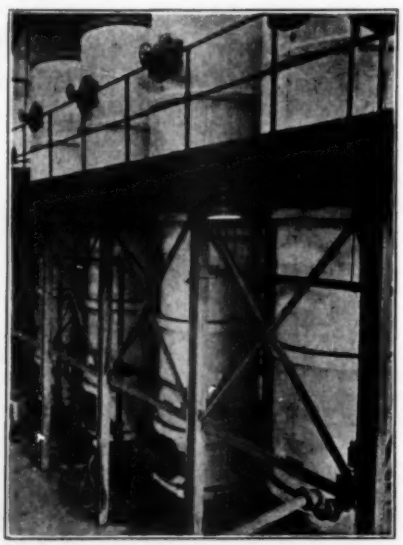
MADE ONLY BY

LOCKPORT FELT CO.

NEWFANE, NEW YORK

IMPROVED BADGER BLACK LIQUOR EVAPORATORS

Recent Installation
CHAMPION
FIBRE CO.
Canton, N. C.



NON-FOAMING

MAXIMUM
STEAM ECONOMY

NO ENTRAINMENT

SODA and
SULPHATE
PROCESSES

E. B. BADGER & SONS CO., Boston, U. S. A.

See page 314 in the 1926 Paper and Pulp Mill Catalogue

Bank of Montreal, 3,437 rolls from Cornerbrook; F. Henjes, Jr., 65 reels from Hamburg; National City Bank, 187 bls. from Hamburg; Journal of Commerce, 117 reels from Kotka; Ossian Ray, 108 reels from Gothenburg; Order, 637 rolls from Hamburg, 55 cs. Rotterdam, 343 reels and 809 bls. Bremen, and 451 reels Norrkoping.

Wrapping—C. Steiner, 12 cs. from Hamburg; Walker Goulard Plehn Co., 18 bls. from Hamburg; Robert Wilson Paper Corp., 46 cs. from Glasgow; Manufacturers Trust Co., 51 cs. from Hamburg; International Forwarding Co., 33 cs. from Hamburg; Gilbert Paper Co., 109 bls. and 62 reels from Gothenburg; Chemical National Banks, 60 bls. from Gothenburg and 36 reels Hamburg; Wilkinson Bros. & Co., 942 bls. from Stockholm and 82 rolls and 6 bls. Norrkoping; F. C. Strype, 36 pkgs. from Antwerp; British-American Tobacco Co., 20 reels from Hamburg; National Consumers Paper Corp., 3 bls. from Rotterdam; W. J. Honan, 9 bls. from Bremen; J. H. Schroeder Banking Corp., 20 cs. from Hamburg; Globe Shipping Co., 29 cs. from Hamburg; Schenkers, Inc., 57 cs. from Hamburg; Insight Paper Co., 432 reels from Oslo; Order, 142 cs. from Antwerp and 142 rolls and 164 bls. Copenhagen.

Cigarette—Surbrug Co., 20 cs. from Havre; Standard Products Corp., 357 cs. from Havre; American Tobacco Co., 1,300 cs. from Bordeaux; DeManduit Paper Corp., 765 cs. from St. Nazaire and 272 cs. Havre; British-American Tobacco Co., 174 cs. from Havre; Southern Pacific Co., 3 cs. from Havre and 200 cs. Genoa; P. J. Schweitzer, Inc., 160 cs. from Marseilles; M. Spiegel & Sons, 23 cs. from Genoa; J. V. Lago, 4 cs. from Alicante; Order, 97 cs. from Hamburg.

Writing—Guibont Freres & Co., 21 cs. from Havre; E. Dietzgen & Co., 24 cs. from Marseilles; A. Murphy & Co., 4 cs. from Bremen; Distinctive Writing Paper Co., 6 cs. from Havre; G. W. Sheldon & Co., 2 cs. from Hamburg; F. L. Kraemer & Co., 4 cs. from London; Eleto Co., 4 cs. from Southampton.

Drawing—H. Reeve Angel & Co., 13 cs. from London; Keuffel & Esser Co., 64 cs and 78 rolls from Hamburg and 11 cs. Southampton.

Tissue—Schenkers. Inc., 15 cs. from Hamburg; W. J. Byrnes & Co., 8 cs. from Liverpool; G. W. Sheldon & Co., 2 cs. from London.

Hanging—Titan Shipping Co., 4 cs. from Southampton; A. C. Dodman, Jr., Inc., 21 bls. from Liverpool and 10 pkgs. Southampton; W. H. S. Lloyd & Co., 90 bls. from Liverpool and 3 bls. London; Importers Freight Servic, 3 bls. from Gothenburg; R. F. Downing & Co., 4 bls. from London, 6 cs. Havre and 2 bls. Hamburg; F. Blank & Co., 16 cs. from Hamburg; E. O'Brien, Inc., 3 bls. from London; C. A. Haynes & Co., 113 bls. from London and 2 bls. Liverpool; G. J. Hunken & Co., 5 bls. from Bremen; F. J. Emmerich & Co., 5 bls. from Havre, 8 cs. Liverpool, 7 bls. London and 9 bls. Hamburg; J. E. Bernard & Co., 8 bls. from Antwerp; F. A. Binder, 5 bls. from Bremen.

Filter—E. Fougera & Co., 66 cs. from Bordeaux; H. Reeve Angel & Co., 26 cs. from London and 67 bls. Southampton; A. Giese & Sons, 65 bls. from Southampton and 29 bls. Hamburg; J. Manheimer, 239 bls. from Southampton; C. Sleicher & Scholl Co., 5 cs. from Hamburg.

Photo—J. J. Gavin & Co., 2 cs. from Liverpool; J. H. Schroeder Banking Corp., 125 cs. from Bremen; Globe Shipping Co., 105 cs. from Bremen; P. C. Zuhlke. 140 cs. from Antwerp; Gevaert Co. of America, 136 cs. from Antwerp and 30 cs. Rotterdam; American Express Co., 57 cs. from Antwerp.

Board—Coty, Inc., 128 cs. from Havre; Globe Shipping Co., 6 cs. from Bremen; Adrian Vuyck, 607 reels from Rotterdam; A. F. Stauff, 10 cs. from Havre; M. B. Daniels, 7 cs. from Bremen; Haas Bros., 114 reels from Rotterdam; Lagerloef Trading Co., 304 bls. from Bremen, 88 bls. Kotka and 630 reels Hamburg; American Express Co., 220 cs. from Hamburg; G. M. Thurnauer, 15 cs. from Antwerp; Perkins-Goodwin Co., 132 rolls from Rotterdam; Order, 64 rolls from Rotterdam.

Miscellaneous—F. L. Kraemer & Co., 25 cs. from Bremen; Whiting-Patterson Co., 46 cs. from Southampton; C. Kofler & Co., 11 cs. from Antwerp; J. Raber, 92 bls. from Gothenburg; E. M. Sergeant Co., 12 cs. from Gothenburg; Favor, Ruhl & Co., 10 cs. from Havre; Hensel, Bruckman & Lorbacher, 19 cs. from Havre, 119 cs. Bremen and 10 cs. Rotterdam; P. H. Petry & Co., 9 cs. from Havre, 10 cs. Hamburg, 9 cs. Bremen and 8 cs. Rotterdam; P. Puttmann, 2 cs. from Havre; Baldwin Universal Co., 24 cs. from Bremen and 8 cs. Hamburg; H. Reeve Angel & Co., 4 cs. from London; Japan Paper Co., 2 cs. from Barceiona and 18 cs. Genoa; S. Gilbert, 64 cs. from Bremen and 11 cs. Hamburg; Kupfer Bros. Co., 14 cs. from Rotterdam;; B. Altman & Co., 5 cs. from Havre; A. Flinn & Co., 7 cs. from Havre; Tice & Lynch, 4 cs. from London and 23 cs. Havre; Borden & Riley Paper Co., 8 cs. from Antwerp; Pearson, Peppars & Co., 2 cs. from Havre; Gallagher & Ascher, 7 bls. from Hamburg; Central Union Trust Co., 24 cs. from Hamburg; International Forwarding Co., 27 cs. from Hamburg and 11 cs. Rotterdam; Danley & Co., 8 cs. from Havre; Judson Freight Forwarding Co., 39 cs. from Rotterdam;; Heemsoth, Basse & Co., 31 pkgs. from Rotterdam; Brown Bros. & Co., 5 cs. from Hamburg; American Exchange Irving Trust Co., 7 cs. from Hamburg; Bendix Paper Co., 15 cs. from Hamburg; Whitfield Paper Works, 10 cs. from Kobe; Globe Shipping Co., 4 cs. from Rotterdam; F. B. Vandegrift & Co., 15 cs. from Liverpool; Paper Service Co., 2 cs. from Liverpool; F. Murray Hill, Inc., 11 cs. from Bremen; Henle Wax Paper Co., 76 cs. rom Rotterdam; Graphic Duplicator Co., 8 bls. from Hamburg; Keller-Dorain Paper Co., 22 cs. from Havre; A. Goodman & Co., 7 cs. from Havre; Coenca-Morrison Co., 6 cs. from Havre and 3 cs. Southampton.

Oliver United Filters, Inc.

Announcement is made that the Oliver Continuous Filter Co. and United Filters Company have been consolidated under the name Oliver United Filters, Inc. All orders and inquiries for Oliver Filter equipment should be addressed to 33 West 42nd Street, New York City and for United Filters equipment to 25 Broadway, New York City.

What does your inspection show?

WHEN the finished paper reaches the inspection room—

And every sheet is scrutinized for defects and imperfections—

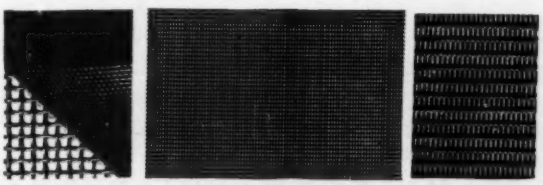
That's where the value of a high-grade, uniformly dependable Fourdrinier Wire is quickly apparent.

If you want to reduce the amount of rejections and "make over" sent back from your inspection room, try a Tyler Fourdrinier Wire on one machine and compare results. Note how straight and true it runs, and note the absence of feathery edges, lumps, wire marks, and holes, in the finished paper.

Supplied in all widths up to and including 234 inches

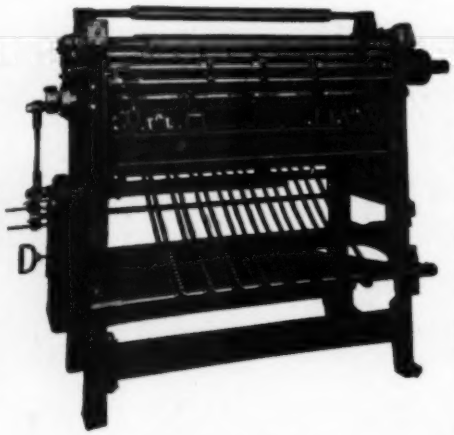
The W. S. TYLER COMPANY,
Cleveland, O.

TYLER WIRES



Backing Wire — Tyler Fourdrinier Wire — Corduroy Cloth

DEPENDABLE DURABLE



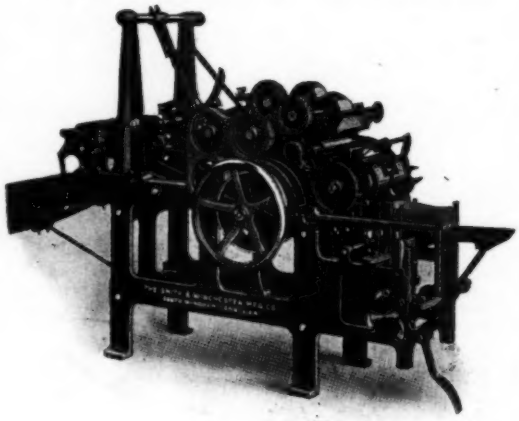
Towel Interfolding Machines

NAPKIN FOLDERS
PRINTING DEVICES
BUNDLING PRESSES

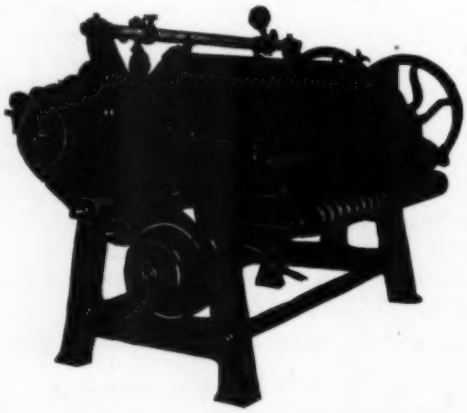
Paper Converting Machine Co.
Green Bay, Wis.

Established 1828
The
Smith & Winchester Mfg. Co.
SOUTH WINDHAM, CONN.

Manufacturers of
Paper Making Machinery



Paper Bag Making Machinery

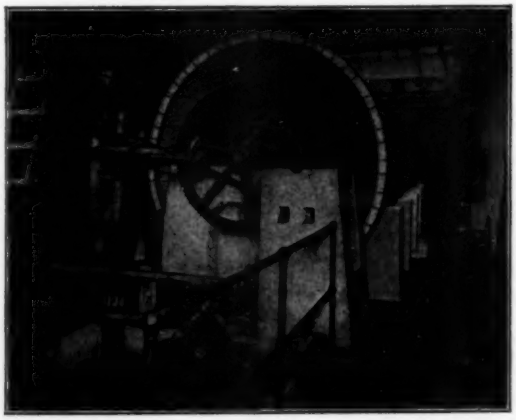


PAPER CUTTERS

Single—Duplex—Diagonal

CUTTER KNIVES
PATENT TOP SLITTERS

HAMBLET MACHINE CO.
LAWRENCE, MASS.



Paper Mill Tanks

The above installation in a well-known Ohio paper mill is only one of Hauser-Stander's successful installations.

Hauser-Stander has been building tanks for over fifty years and has particular knowledge of paper mill men's requirements.

The Hauser-Stander Tank Co.
CINCINNATI, OHIO

Market Quotations

(*Continued from page 737*)

BONDS	Bid	Asked
St. Regis Paper Co. 6½s, 1931	99	101
St. Regis Paper Co. 6s, 1931	100	101
St. Anne Paper Co. 6½s, 1953	103	105
St. Croix Paper Co. 5s, 1928	99	
St. Helena Pulp & Paper 6s, 1941	99	
St. Lawrence Pulp & Lumber 6s, 1933	7	9
Spruce Falls Power & Paper Co. 5½s	98	100
Spanish River Pulp & Paper 6s, 1931	103	
Stevens & Thompson Paper 6s, 1942	95	97
Southern Advance Bag & Paper 6s, 1947	97	
Smith (Howard) Paper Co. 6s, 1941	103½	
Smith (Howard) Paper Co. 5½s, 1953	95	98
Taggart Bros. 6s, 1944	95	100
Tait Paper & Color Industries 6s	88	90
Ticonderoga Pulp & Paper Co. 6s	100	102
Tonawanda Paper Co. 5½s	99	101
United Wall Paper Co. 6s, 1947	96	98
Watab Paper Co. 6½s, 1942	102	104
Whitaker Paper Co. 7s, 1938	108¼	109½
Westfield River Paper Co. 7s	89	93
Warren (S. D.) 6s 1945	102	
Whitmer (Wm.) Sons Parsons Pulp & Lumber Co. 8s	20	25
Waterway Paper Products 6s, 1931	101	
Donnacona Paper Co. 6s, 1948	98	100
Orono Pulp & Paper Co. 6s 1943	102	
Orono Pulp & Paper Co. 6s, 1941	97	

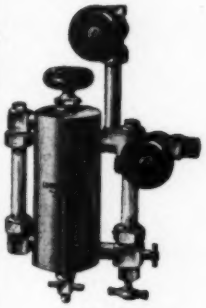
STOCKS		
American Book Co. Common	143	147
American Sales Book Co. Pfd	106	108
American Sales Book Co. Common	79	80
Androscoggin Pulp Co. Common	30	
Androscoggin Pulp Co. Pfd	90	
Brown Company Pfd.	95	97
Belgo Canadian Paper Co. Pfd	106	110
British Columbia Pulp & Paper Common	7	9
British Columbia Pulp & Paper Pfd	70	
Canada Paperboard Co. Pfd	90	94
Champion Fibre Co. Pfd	107	
Champion Coated Paper Co. Common		125
Champion Coated Paper Co. Pfd	105	107
Chemical Paper Company 1st Pfd	90	
De Jonge (Louis) Pfd	95	97
Dryden Paper Co. Pfd	42	44
Diem & Wing Pfd	92	97
Downington Paper Company Pfd	103	
Downington Paper Company Common	93	
Eastern Manufacturing Co. 1st Pfd	60	62
Eddy Paper Company Common	30	
Escanaba Paper Co. Pfd	40	
Escanaba Paper Co. Common	4	
Folding Box Units	30	
Fidalgo Pulp Mfg. Co. Common	75	
Glatfelter Paper Co. Common	103	107
Great Northern Paper Co. Common	77	80
Gair (Robt.) Co. new Common	45	50
Hawley Paper Company Pfd	96	
Hammermill Paper Mills Pfd	109	110½
Holyoke Card & Paper Co. Pfd	170	
Hinde & Dausch Company Pfd	101	103
Hinde & Dausch Company Common	180	
Indiana Flooring Co. Common		7
International Pulp Co. Pfd	73	
International Textbook Co.	30	34
Jessup & Moore Paper Co. 1st Preferred	33	38
Jessup & Moore Paper Co. Common	5	10
Keyes Fibre Co. Common	43	45
Marathon Paper Mills Common	125	
Marathon Paper Mills Pfd.	170	
Minnesota & Ontario Paper Co. Pfd.	73	77
Missisquoi Pulp & Paper Co. Pfd.	90	95
Munising Paper Co. Common	22	25
Munising Paper Co. Pfd.	82	85
Morris Paper Co. Units	150	
Northern Paper Mills Co.	30	
National Paper & Type Co. Pfd.	77	83
Orono Pulp & Paper Co. Common	40	45
Oglesby Paper Company Preferred	101½	
Occident Paper Co. Preferred		15
Oxford Paper Co. Preferred	109½	110½
Oxford Paper Co. Common	188	
Parker Young Co. Preferred	85	90
Parker Young Co. Common	25	30
Penobscot Chemical Fibre Co. Common	80	
Price Bros. Common	90	
Package Paper & Supply Units	22	
Robertson Paper Co. Preferred	5	
Robertson Paper Co. Common	50	
Rogers Paper Company	45	50
Southern Paper Co. 2nd Preferred	OW	
Sorg. (Paul) Paper Co. Pfd.	100	
Sorg. (Paul) Paper Co. Common		BW
St. Regis Paper Co. Preferred	105	106½
St. Croix Paper Co. Common	160	
United Wall Paper Co. Preferred	90	95
United Paperboard Co. Preferred	58	65
West Virginia Pulp & Paper Co. Common	57	60
West Virginia Pulp & Paper Co. Preferred	101	103

Effective Aids in the attainment of Efficient Lubrication

LUNKENHEIMER

LUBRICATORS

OIL CUPS AND GREASE CUPS



Bronze "Senior" Lubricator Hydrostatic Double Connection

Bronze Spring Lid Oil Cup

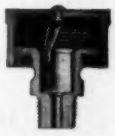
"Sentinel" Oil Cup With Sight Feed

Bronze Hinge Lid Oil Cup

Bronze "Junior" Lubricator Hydrostatic Single Connection

Plain Bronze Oil Cup

Bronze "Ideal" Grease Cup Automatic Feed



Bronze "Tiger" Grease Cup Packed Base Cup Screw Feed

The Lunkenheimer Company manufactures a complete line of Lubricators, Oil Pumps, Oil and Grease Cups, in a wide range of types, sizes and capacities.

Lunkenheimer Distributors are located in all industrial centers and carry complete stocks. They will fill your requirements promptly.

THE LUNKENHEIMER CO.

"QUALITY"

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22023-22-67

Lindsay Spiral Weave Fourdrinier Wires

(Patented Oct. 1927)

Represent the latest idea in paper machine wire cloth.

They prevent grooving of Suction Boxes, scoring and filling up of seams. This overcomes the necessity of planing the suction box covers and adds to the life and tonnage of the wires.

Lindsay Wire Weaving Company

Collinwood Station CLEVELAND, OHIO

THE DRAPER FELT

Unexcelled for strength, openness, resiliency, and general running qualities. Made to meet the most exacting conditions on all types of machines and all kinds of papers. Only one grade and that the highest.

Made by

DRAPER BROTHERS COMPANY

CANTON, MASS.

Woolen Manufacturers Since 1856

REPRESENTATIVES

L. H. BREYFOGLE, Kalamazoo, Mich. INTERNATIONAL TRADING CO., Philadelphia, Pa.

PACIFIC SALES COMPANY, Security Bldg., Portland, Ore.

West Virginia Timber Co. Preferred	90	96
Watervliet Paper Company	10	20
Watson (H. F.) Paper Co.	125	
Wayagamack Paper Co.	104	108

Foreign Trade Opportunities

The following foreign trade opportunties are issued by the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce. Those interested are requested to communicate with the Bureau at its offices in Washington or New York or its branch offices in other cities, in every case mentioning the number of the inquiries referred to.

No. 31587—Cardboard, such as used for address labels. Copenhagen, Denmark. Purchase and agency desired.

No. 31614—Bag manufacturing machines, for paper cement and other bags. Turin, Italy. Purchase desired.

No. 31588—Cotton cellulose. Liverpool, England, Purchase desired.

No. 31586—Cover paper, and paper specialties. Toronto, Canada. Agency desired.

No. 31589—Machinery for corrugated paper manufacture. The Hague, Netherlands. Purchase and agency desired.

No. 31548—Paper goods and supplies. Milan, Italy. Agency desired.

No. 31510. Rosin. Naples, Italy. Purchase desired.

No. 31513—Rosin. Hanover, Germany. Purchase and agency desired.

No. 31662—Overissued newspapers. Calcutta, India. Purchase desired.

No. 31711—Paper-slitting machine for cutting serpentines or small rolls of paper. Seville, Spain. Purchase desired.

No. 31712—Writing paper. Madrid, Spain. Agency desired.

No. 31662—Wood rosin. Calcutta, India. Purchase desired.

No. 31831—Cardboard. Calcutta, India. Purchase desired.

No. 31796—Newsprint paper. Cairo, Egypt. Agency desired.

No. 31749—Rosin. Dresden, Germany. Purchase desired.

Timber Contract to Edw. Hines Lumber Interests

The U. S. Forest Service today confirmed the report that it has accepted the bid of the Edward Hines Associated Lumber Interests of Chicago for lumbering 890,000,000 feet of mature commercial timber in the Malheur National Forest in Northwest Oregon. The Hines interests succeed Fred Herrick and Associates, whose bid was accepted in 1922, but has not been satisfactorily fulfilled.

The Hines bid was $2.85 per thousand for the pine timber; $1.10 per thousand for fir; and 60 cents per thousand for other species. In accordance with the Forest Service practice, the tract will be lumbered selectively, the productivity of the forest being maintained. The Government will receive $2,194,500 for the pine alone. The timber may be all taken out within thirteen years, and twenty years is the limit. Other Government timber will be available when the present contract is completed. The extent of the Malheur Forest is such that lumbering operations will be perpetual at the rate of cutting permitted—growth offsetting cutting. The total stand of Government timber is 7,000,000,000 feet, besides several hundred million feet of privately owned timber. The Hines interests have until August 1 to consummate the contract.

Baker Now With Stein, Hall & Co.

W. E. Bryon Baker recently resigned his position as chief chemist of the Continental Paper and Bag Mills Corporation to take a new position with Stein, Hall & Co., Inc., 285 Madison avenue, New York, where he will be engaged in research and development work in the manufacture of gums, starches, and products derived from starches and their applications in paper manufacture and conversion. The development work will deal with many types of starches differing both in respect to origin and chemical treatment.

TRADE MARK

B

Registered

DIAMOND B SPLICING TISSUE

HIGHEST QUALITY

SPECIALLY MADE FOR THE PAPER TRADE

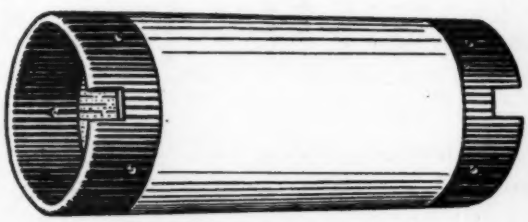
PRICES ON APPLICATION

BEMIS ASSOCIATES INC.

WATERTOWN, MASS.

ELIXMAN PAPER CORE CO., INC.

Corinth, N. Y. U. S. A.



Canadian Elixman Co., Ltd., Hamilton, Ontario

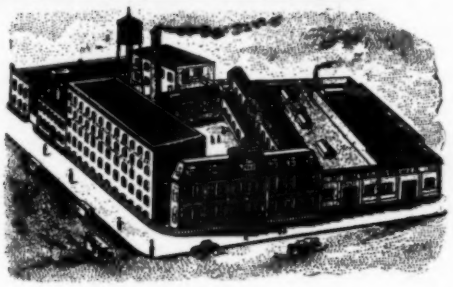
WATERVLIET PAPER COMPANY

WATERVLIET, MICHIGAN

Manufacturers of

Coated Book and Coated Lithograph Papers

THE WM. CABBLE EXCELSIOR WIRE MANF'G CO.
MANUFACTURERS OF
SUPERIOR FOURDRINIER WIRES
Bricking Wires
Cylinder Faces & Washer Wires
Red Brass Brush Wire



For 80 Years we have specialized in the manufacture of brass Fourdrinier Wires, Cylinder Covers, Washer Wires and Save-all Wires as well as Phosphor Bronze Fourdrinier Wires and Cylinder Covers.

Established 1848

Offices and Warehouses:

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143-151-163 Union Ave.
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For Digesters, too, Biggs Is the Standard of the Industry

The substantial construction, convenient operation and perfect agitation of Biggs revolving digesters has made this type of equipment as well and favorably known as the widely used Biggs Rotary.

Our capacity for fabricating 1½-inch plate enables us to build all special types and sizes of digesters, bleaching boilers and engines, and other heavy steel plate equipment promptly and accurately.

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